TRANSACTIONS

QK1
.T8181
1893
v.12

OF THE

ALBANY INSTITUTE,

VOLUME XII.

Mo. Bot. Garden,
1898.

ALBANY, N. Y.:
AMASA J. PARKER, RECEIVER OF WEED, PARSONS & CO., PRINTER.
1893.

Printed under the supervision of George W. Kirchwey, Philander Deming and Leonard Kip, Publishing Committee from 1887 *to* 1892, *within which period the articles herein presented were contributed.*

TABLE OF CONTENTS.

PAGE.

In Memoriam — Henry Augustus Homes. By G. W. Kirchwey - - - - - - - - - - - 1

The Talmud. By Max Schlesinger - - - - - - 15

Profit Sharing. By Frederick G. Mather - - - - - 27

The First Constitution of New York. By S. N. D. North - 39

The West India Company and the Walloons. By Ernest J. Miller - - - - - - - - - - - 53

Some Views Connected with the Question of Coast Defense. By Verplanck Colvin - - - - - - 69

Edible Wild Fruits of New York. By Charles H. Peck - 83

Our Retrospect. By Leonard Kip - - - - - - 103

The First Battle of Lake Champlain. By George F. Bixby - 122

The Liquor Question. By Eugene Burlingame - - - - 137

Christian Science, Mind Cure and Allied Methods of Treatment. By Selwyn A. Russell - - - - - - - 167

Meteorological Stations — Pike's Peak in its Winter Season. By J. P. Finley - - - - - - - - - 189

Paper Currency. By Sidney W. Rowell - - - - - 205

Insects of the Past Year and Progress in Insect Studies. By J. A. Lintner - - - - - - - - - - 227

PAGE.

The Globe of 1513 and the Progress of Geographical Discovery and Map-making from the Time of Columbus. By George R. Howell - - - - - - - - 241

Weeds. By Charles H. Peck - - - - - - 251

The Standard of Value. By Chauncey P. Williams - - 267

Magnetic Observations near Albany, N. Y., between the Years 1686 and 1892. By Verplanck Colvin. - - 283

OFFICERS OF THE ALBANY INSTITUTE FOR 1893.

President.
LEONARD KIP, LL. D., L. H. D.

Treasurer,
SIDNEY W. ROWELL.

Recording Secretary and Librarian,
GEORGE R. HOWELL.

Corresponding Secretary,
ERNEST J. MILLER.

First Department — Physical Science and Arts.

President,
VERPLANCK COLVIN.

Vice-President,
ALBERT VANDER VEER.

Recording Secretary,
WILLIAM HAILES, JR.

Corresponding Secretary,
SAMUEL B. WARD.

Second Department — Natural History.

President.
JOSEPH A. LINTNER, Ph. D.

Vice-President,
CHARLES H. PECK.

Recording Secretary,
HENRY P. WARREN.

Corresponding Secretary,
JOHN W. McNAMARA.

Third Department — History and General Literature.

President.
WILLIAM L. LEARNED., LL. D.

Vice-President,
THOMAS J. VAN ALSTYNE.

Recording Secretary,
JOHN V. L. PRUYN.

Corresponding Secretary.
FREDERICK M. GRAY.

Curators.

MAURICE E. VIELE,
MAX SCHLESINGER,
HARMON P. REED,
C. M. JENKINS,
EUGENE BURLINGAME,
CHARLES M. CULVER,
FREDERICK TOWNSEND,
GARRETT A. VAN ALLEN

Publishing Committee.

WILLIS G. TUCKER, Ph. D. PHILANDER DEMING, LEONARD KIP.

HENRY AUGUSTUS HOMES.

At a memorial meeting of the Albany Institute, held on the 6th day of December, 1887, in commemoration of Henry A. Homes, LL. D., who died on the 3d day of November, 1887, the following papers were read:

In Memoriam.

By George W. Kirchwey.

Henry Augustus Homes was born in Boston on the 10th day of March, 1812. He was of the royal blood of New England, sprung from one of those sturdy families whose roots run back into the heroic ages of our history. His father was a wealthy, benevolent Boston merchant, a pillar of the old Park street church, devout, upright, generous and just. His mother was a noble example of New England womanhood, full of intelligence, kindliness and piety. Out of the earnest, refining influences of such a home, at the early age of ten, young Homes was sent to Andover to prepare for college; and in 1826, when only fourteen years of age, he entered Amherst College.

He pursued his course in college with such success as he craved. He was not ambitious for the ordinary distinctions of a college career, and cared still less for those which depend on that mysterious quantity called popularity. He read much and thought more and, although he carried off few of the honors for which men strive in college as elsewhere, he did not fail to gain those more difficult because more intangible and greater honors which come unsought. He was regarded by his classmates as well as his teachers as a boy of unusual mould. He had a certain unique popularity, in which respect for his manly qualities and an appreciation of his striking intellectual personality were perhaps the largest ingredients. He won his share, too, of those college friendships, which abide with a man through life, and these were a source of unfailing pleasure and inspiration to him to the end.

One who knew him well in college (Prof. Tyler of Amherst) gives a graphic account of him as he appeared in those days:—"He had a species of dry wit, sometimes shading off into drollery and sometimes inclining to good-natured satire. His words were few, his sayings brief, pointed, not unfrequently aphoristic. He was an original, unlike any of his classmates, different from other men generally. He had a mind of his own, a will which was well-nigh inflexible, opinions which were not easily changed. Introverted, absent-minded, more or less moody and solitary, naturally reticent, but, when he did speak, outspoken, frank, fearless, generous and just, he made few acquaintances or friends, but those few were strongly attached to him." How true it is that the man is but the child larger grown! This picture of the school-boy of seventeen is substantially the same as that which the man who has but now gone out from us had, in more than half a century of a beneficent life, in larger, firmer lines, engraved upon our memories.

At that same early age he displayed also those qualities of liberality and kindly helpfulness which will at once be recognized as permanent traits of his character by all who knew him at any time during his life. Although the son of a wealthy and generous father and having more money than any other member of his class, it is recorded of him that "he put on no airs, made no pretensions, spent no more on himself than others did, but was always liberal in gifts to his society, the class, the college, to all who were in need." His last act on the day of his graduation is cited as characteristic. It was to "put his hand into his pocket and liquidate some unforeseen expenses of the class at commencement." He had an honorable though not a distinguished part on the commencement stage. The subject of his oration—"unique like himself," as a fellow student has characterized it—was *Temperament in Genius*, a theme, the mere selection of which for that supreme occasion in a boy's life, showed the self-reliant and original as well as the meditative cast of his mind.

We have dwelt so long upon these four short years of college life, not because of their intrinsic importance in the life of Dr. Homes, not because of the space which they filled in the chambers of his memory throughout that life, but because of the revelation which they afford of his nature, his mental and moral tendencies, the sources of his inspiration, the rooted elements of his character. In these essential respects he seems to have changed less than most men do, or perhaps in these respects he was a man long before he had ceased to be a child. Certain it is that this boy of eighteen, as he stood on

the threshold of life, had the thoughts, the habits of mind, the set purpose, the grave, quiet demeanor, the generous impulses, the purity of thought and deed, the true nobility of soul which we have all known and gratefully recognized in the friend whom we have lost.

After leaving college he was in no haste to embark on a professional career, nor even to decide definitely what course of life to pursue He seems to have had no strong leaning toward any of the money-getting pursuits, and certainly had no ambition to shine in any profession. While not in the least degree indolent, he had a good deal of the habit of mind which predisposes a man to await the summons of God or man to his career, and for a long time he waited in vain. He went — as the fashion then was — from Amherst to Andover Theological Seminary, and thence in 1833 to Yale College, where he spent two years in the study of theology and medicine. He then went abroad, lived for a year in Paris, too deeply engaged in the study of Arabic to become at all enamored of the gay life of that city, and then in 1838 offered his services to the American board and went as a missionary to Constantinople.

It is not known when he first formed the design of devoting his life to the mission cause, but it is probable that it was with this end in view that he went from Andover to Yale, in order to add medicine and some knowledge of the Oriental tongues to his theological equipment. However this may be, he had no sooner resolved upon this career than he threw himself into it with characteristic energy and devotion. His preparation for it was deliberate and thorough. He entered that difficult field admirably equipped, prepared at every point, full of zeal and high purpose. His influence was felt at once in every departmeni of the work of the mission. He preached and taught in more than one of the Oriental tongues whose sounds are heard in that polyglot city; he held daily conversations on personal religion with the natives of various creeds and nationalities; he taught classes of Turks and Arabs to speak English; he practiced the healing art among them. It is recorded that he shrank from no duty and hesitated at no sacrifice.

He early discovered that the great need of the mission was a steady supply of fresh, vitalizing religious literature, and he at once turned his attention in the direction of meeting this want. During nearly the whole period of his fifteen years' service in that field he made this department of the work his own. He wrote, translated, published and distributed religious books, tracts and papers incessantly; he became the business manager of the mission, and he found time for

all this additional labor without interrupting the work of preaching and teaching and learning which had first engaged him.

Though stationed at Constantinople he traveled extensively over the Turkish Empire. In 1837, he traveled in Syria, visited Beirût and Jerusalem, and spent several months in Damascus studying Arabic. In 1839, he went on an exploring expedition with Dr. Grant among the Koords and in Mesopotamia. Wherever he went he was a careful observer and faithful student of the institutions, character and condition of the people. His letters and journals, of which copious extracts were published in the *Missionary Herald* during all the years of his missionary life, are full of valuable and interesting information regarding the geography, history, manners, morals and religion of those countries which are so rich in classical and sacred associations, while at the same time they illustrate his varied and unwearied labors in his missionary work. A letter from the Armenian Christians, as his friend Prof. Tyler informs me, "bears strong and cordial testimony to the wisdom, zeal and enthusiasm with which he discharged his duties in various departments, and particularly in the preparation and circulation of religious books and in the instruction of youth."

At length, after some fifteen years of faithful labor, interrupted by only one visit to his native land in 1842, he passed by a natural transition from the service of the Missionary Board in Constantinople to the service of the United States Legation in the same city, for which by all the experiences of those fifteen years he was peculiarly qualified. He served the legation with fidelity and success as *chargé d'affaires* during the three ensuing years, until, in 1853, he returned to America to take up the thread of his life again in his native land.

He was now forty-one years of age, at the height of his powers, ripened by travel and experience, enriched by self-denying labor and sacrifice in the greatest of causes, and an honorable career rounded out with noble achievement behind him. But it was not until he had finally turned his back upon the first period of his native career, distinguished as that had been, that his true vocation disclosed itself. In 1854, the year after his return from Turkey, he received the appointment of assistant in the New York State library, becoming in 1862 the librarian of the general library, a position which he held to the time of his death. What fortunate inspiration guided the trustees of our State library to this faithful but unwearied servant of the Most High, this quiet scholar in his retirement in Boston, we do not know; but certain it is that never was wiser choice made. It is no disparagement to his learned and able associates to say, that from the day of

his entrance upon his labors in the library in a subordinate capacity, he became its presiding genius. From that day to the day when the hand of death was laid upon him, a period of over thirty years, he guided its policy, inspired its development and directed its energies. As it stands there to-day, it is his eloquent monument.

What rare combination of moral and intellectual qualities was required to develop the general library of the State from a miscellaneous collection of 25,000 books into an orderly, harmonious arrangement of 100,000 selected volumes, to put this great collection into the foremost rank among the great libraries of the country and to maintain it there, can be but imperfectly set forth. Here, at any rate, he found full scope for the exercise of the admirable conservative qualities with which nature and all the experiences of his previous life had endowed him. He entered upon his task in the library in the same spirit of devotion, with the same temperate but unquenchable zeal with which he had carried on the work of christianizing the Orient. He was industrious beyond the industry of younger men. He labored incessantly. Like the stars — and too often when they were visible in their courses — he pursued his vocation "without haste, without rest." He had no *avocation*. In fact, a study of his career in the library yonder may well dissipate the impression which has somehow gone abroad that a librarian is a person of great leisure; that his office is the earthly realization of the *otium cum dignitate* idea. Let that thought perish in the presence of this man of letters who yet had no time to write, this laborious scholar who had not the leisure to inscribe his name in the annals of scholarship, this student whose time was not his own.

Apparently he had no temptation to labor, no ambition to strive for laurels, in other fields than his chosen one. He magnified his office, was content with its labors and satisfied with the rewards which they brought him. In fact, Dr. Homes was a born librarian. He was not a learned man in the modern sense of the term; he was not distinguished for profound researches in any department of human knowledge; he knew no one thing so well that he could know nothing else; he had not accumulated such a mass of microscopic facts that the perspective of ordinary facts was destroyed. Without presuming to disparage in the least that minute study of nature and man which has in our time revolutionized half the sciences and is now revolutionizing the remaining half, it will be conceded that Dr. Homes gained in range of information, in breadth of view, in flexibility of mind, what he lost in intensity of observation; that he was not less

great as a librarian by virtue of his exclusive devotion to the exacting duties of his well-loved profession.

This is a matter of no little importance in these days when even the chiefs of great libraries look outside of the library field to special lines of activity and research for a more enduring fame. It may well be doubted whether a man is a better librarian by virtue of being a distinguished historian, or editor, or philosopher; whether, indeed, success in a special line of intellectual activity or devotion to a particular branch of human knowledge is entirely compatible with that broad and catholic, yet discriminating knowledge of books which it is the peculiar province of the librarian to illustrate.

This intimate and yet comprehensive knowledge of books, Dr. Homes possessed in an eminent degree. His interest ranged as wide as the printed word, and his vision kept pace with his interest. All arts, all sciences, all literatures were his province. Nothing escaped him. He knew by an unerring instinct the best books, the books that were destined to survive, in all languages and in all departments of knowledge. On the other hand, he never fell a victim to the fatal confusion of mind of Gœthe's traveler who saw not the forest by reason of the wilderness of trees about him. While preëminently a man of books, he never lost the library in the volumes which he accumulated on its shelves; he never forgot that the books he sought were to take their places in the ranks of the great army of occupation which he was marshaling and for which he was recruiting.

Then, too, he was a genuine bibliophile. He loved books and the atmosphere which emanated from them, but he loved them wisely—not too well. With abundant means, and with unrivaled facilities for the gratification of the master passion of the book-lover, he left behind him but a meagre private library. The unique volume, coveted by the collector, appealed to him in vain; while the sorry pamphlet, caught up out of the ruin of a lost cause, claimed his instant allegiance. He was too sane, too disinterested ever to become the slave of his books. In these, as in other respects, he was preëminently fitted for the place which he so long and honorably filled. The mere human book-worm is almost as much to be dreaded in such a position as is his insidious prototype among the leaves. The man with a hobby, the specialist, the collector, the worshippers of tooled-edges and book-plates—are all alike to be shunned. If they do not belong to the hateful *profanum vulgus*, against whom the doors of all sanctuaries are closed, they are yet by virtue of their ruling passion conspicuously unfitted for the labor which the late chief of our great library so ably performed through a generation of laborious years.

This combination of qualities, which Dr. Homes possessed in so eminent a degree, is very much rarer than we are apt to imagine, and as valuable as it is rare. If there exists such an emanation from the Universal Intelligence as the library *Genius*, it can be nothing else than a subtle combination of that comprehensive range of vision, that unerring instinct, that fine sense of fitness and proportion, that catholic yet chastened love, that industry quickened by zeal, which were never more harmoniously joined than in the subject of this imperfect tribute.

With what an exclusive devotion Dr. Homes confined himself within the round of duties of his vocation has been referred to. What he might have accomplished in that field of letters if he had allowed himself to stray into that alluring path of life, we are forbidden to know. That he had the literary instinct, the habit of mind which predisposes a man to express himself in letters, no one who came into contact with him could fail to discover. The few stray leaves which fell from his table gave evidence of his possession of several, at least, of the qualities which lead men to the heights of literary success. Along with a richly stored mind went powers of acute analysis, close observation, shrewd reflection, industry and judgment in research, and clear and lucid statement. His style was excellent, dignified yet rapid, and his logic invincible. His few scattered writings — scattered at wide intervals along the years and in ephemeral forms — won instant recognition from the masters of the subjects he treated. The wide sweep of his interest and scope of his information are well illustrated in these rare pamphlets, in which he ranges from Mesopotamian missions to Numismatics, and from local history and genealogy to library economy.

There are those who, realizing his qualifications for a literary career, and failing to appreciate the true importance of the librarian's work in the world, have lamented his exclusive devotion to that work. One of these men — himself one of the leading historians and not the least among the librarians of America — said recently: "It is a pity that Dr. Homes did not write more. He might have made a name in the field of historical research." The nature of our rejoinder to this and all like regrets has been disclosed. We are not prepared to admit that our distinguished associate, who has gone out from among us, could have done more to make straight the crooked ways of humanity in any other path of life than in that which he so long, so faithfully and so successfully pursued.

He seems to have had not a trace of that vulgar craving for noto-

riety, from which not even all our great men are wholly exempt. He had no ambition to shine in the world, not even to become prominently known in connection with his library work. Of the many distinctions which attended his faithful service in the cause of learning, he valued chiefly the degree of *LL. D.*, conferred upon him, in 1873, by Columbia College, and in regard to this he wrote to his friend, Prof. Tyler, that it was as unexpected as it was undeserved. "I have not the slightest idea," he wrote, "from whence proceeded the influence that had it bestowed on me. I think it such a mark of friendship that I wonder one's friends do not give him a chance to know who loves him enough to go out of the way to do something for him."

The men of this sort, who are content to do the chosen task faithfully and unostentatiously, who deem themselves unworthy of the honor which meaner men seek all their lives to gain, such men are not so common in the world that they run much danger of being overlooked. Accordingly Dr. Homes did not, especially during the latter part of his life, lack the satisfaction of appreciation and honor at the hands of those who were fitted to recognize his worth. The bed on which he lay those long months, waiting with resignation the approach of death, was watched with anxious foreboding, not only by the faithful wife and son and the friends of his hearth, but throughout the land by the men whom *we* would wish to breathe a regret over our graves — the men of letters and learning, scholars in high places, the presidents of our great colleges, the chiefs of our great libraries, all those who by the masonry of learning and the insight of wisdom and high service recognize those who are akin to themselves.

By Horace E. Smith, LL. D.

Mr. President, the opportunity of joining in this tribute to the memory and worth of Dr. Homes affords me a melancholy pleasure. My personal acquaintance with him extends only through the last decade; but that acquaintance was of a very pleasant character, and quite long enough to impress me thoroughly with his worth, and command my warm regard. In all my intercourse with him he was kind and courteous, and his whole bearing that of the cultured gentleman.

From my personal observation and the testimony of others, I judge that he was a man of liberal intellectual endowments and ripe scholarship. His character, it seemed to me, while not wanting in firmness and strength, was distinguished by singular transparency and purity.

That he was faithfully and earnestly devoted to his duties, in whatever sphere his activities were employed, there can be no doubt. The decease of such a man is a severe loss to the world. True, the life-work of Dr. Homes was not such as to strongly attract the public gaze and rank him among the most conspicuous characters of history; but it may, nevertheless, have been a greater boon to the world, more influential for the best interests of humanity, than the deeds of many whose names have filled the trumpet of fame.

As in nature, so in human affairs, the noiseless forces are often the most effective. The earthquake and the tornado are noisy and terrific, but their force is insignificant in comparison with the silent rays of the sun, or the noiseless but resistless energy of gravitation. We study the record of the world's great battles, the rise and fall of dynasties, of empires and kingdoms, and call it *history;* but these are only the prominent incidents of history, the culminations and outward manifestations of potent forces, which for a longer or shorter period had been silently preparing the way and pressing to their issue the great events. To the quiet workers in the domain of letters, of science, the arts, benevolence or religion, men of pure motives and noble purpose, is the world often more indebted for its advancement in civilization, in its grand achievements, than to the more distinguished historic characters who have worn the crown of civic or military honor.

It is no extravagance to say that the death of such a man as Dr. Homes is a public calamity. I said the *death* of such a man. "Death" is an unfortunate term. In the higher and truer significance of what the word is used to express, it is a misnomer. To the Christian, at least, the words of Longfellow are no less true than beautiful:

> **"There is no Death! What seems so is transition;**
> **This life of mortal breath**
> **Is but a suburb of the life elysian,**
> **Whose portal we call Death."**

The term is more befitting Paganism than Christianity. I much prefer the old Hebrew expression — "He slept with his fathers;" or, better still, the exquisitely tender uttterance — "He giveth His beloved sleep." But, to my own mind, neither "death" nor "sleep" conveys a just idea of the exchange of worlds: "*transition*" is the better term. Whether quite orthodox on this point may be questionable, but I am unable to entertain the thought that the soul, the immaterial and immortal part of man, will ever be in other than a state of con-

scious existence. "The rest that remaineth" is not, I think, the rest of unconsciousness or of idleness; it is the rest of perfect freedom. All the faculties of the soul, with their incalculable possibilities, will not be less active when freed from the fetters of this corruptible body. We may, then, think of our departed friend as living in the full freedom and light of the Heavenly world. But he is not wholly lost to this world. He still lives in his worthy example and in the influences which his life-work set in motion; influences that will continue to bear fruit long after his mortal remains shall have returned to dust.

While visiting the museum of Brown University a few years since, my attention was directed to a relic which interested me more than all else I there saw. It was simply the root of an apple tree, but it had a history. It was taken from the grave of Roger Williams on the removal of his dust from the place where his body was originally deposited, long after that body was resolved into its native element. At the time of his burial an apple tree stood at the head of his grave, and one of its roots seeking nourishment and guided by a mysterious instinct of vegetable life, made its way downward, penetrated the coffin and fed upon the decaying remains. It passed down the trunk, then dividing into branches, moved along the limbs to the feet, and there turning upwards, continued its way to the extremities. The dry root, carefully preserved in the museum, still repeats the story of this marvelous process. The nourishment thus sought and found was sent up into the tree and there converted into fragrant blossoms and rich fruit. If the decaying and unsightly remains of this mortal body may be thus transmuted, how much more beautiful and precious are the flowers and fruitage of a "*life*" like that of Dr Homes.

At a subsequent meeting of the Albany Institute, held on the 3d day of January, 1888, the following memorial paper was read:

By David Murray, LL. D.

Mr. President, it was a matter of great regret that I could not attend the meeting of the Institute which was devoted to the memory of Dr. Homes. I would have been pleased to add a word in honor of one whom I had long loved and respected. The Albany Institute had good reason to reverence Dr. Homes' memory. Few within its membership had done so much as he toward rendering its meetings profitable and interesting. For many years he has been a constant and

notable attendant, and the proceedings will often show the distinguished part he took and the important contributions he rendered. Dr. Homes was, in essential particulars, a scholar. In his early life he had acquired those habits of scholarly investigation which he maintained up to the end. He was accurate in his thought and his statement, and always had a very positive and decided opinion upon any question on which he had taken the trouble to make up his mind.

From the nature of his occupation he was a librarian. His mind took that bent early in life. In addition to the accurate knowledge which he had of some books, he had a workman's familiarity with all books. To him a book had its place not only on the shelves of the student, to be by him used in the daily routine of his life, but also its place in a permanent collection, where its use might be rare and unusual. Much study has been bestowed on the arrangement and cataloguing of books so as to make them available with the least expenditure of time and with the greatest advantage. Among those who had devoted thought to this problem, Dr. Homes was easily one of the chief. The New York State library has grown to be what it now is largely through his wise and persistent efforts. He had charge of the general library for about thirty years. With one exception he was the senior of all the persons who at the time of his death were in the service of the State. He began his service in 1854, and two years after this, in 1856, the library contained in the *general library* 30,111 *volumes*, and *in the law library* 13,623 *volumes; in all* 43,734 *volumes.* At Dr. Homes' death in the autumn of 1887, there were *in the general library* 94,526 *volumes, and in the law library* 39,867 *volumes, in all* 134,393 *volumes.* Of this increase it is safe to say that every volume in the general library came under his personal attention and received his approval.

During this time the Legislature appropriated for the purchase of books till 1883 the sum of $4,000 each year. Since 1883 the appropriation has been $5,000 a year. Out of this sum provision is made for the increase not only of the general library but of the law library. A large part of this appropriation is required in both departments to keep up the serial publications, which form a material and important part of every library. During the last year ending October 1, 1887. the sum of about $500 was expended for serials in the general library and $925 in the law library, making in all about $1,425 out of the entire appropriation of $5,000. It is plain that the sum available for the purchase of ordinary books for a growing collection like the State library is exceedingly meagre, and the steady and continuous growth

of this collection under circumstances so disadvantageous is a matter of great credit to those who have had charge of the increase. Many private gentlemen expend more in the increase of their collections than the State of New York on its library. If it had not been for the donations and exchanges with which this library has been favored, the increase would have been much less than now appears. The Legislature, in addition to the appropriation which it annually makes for the purchase of books, provides for the printing of a considerable number of documents pertaining to the business brought before it, and of all reports made to it. It also publishes volumes of the reports of the Supreme Court and the Court of Appeals, and volumes of the documents relating to the history of the colony and the commonwealth, and volumes of the Natural History of the State. These publications are to a greater or less extent distributed by the State library under the authority of the Legislature among the several States and Territories of the Union. In return for this constant stream of benefactions which the great State of New York is pouring into all the other States she is receiving from them according to their ability the publications which they are issuing.

What is to a certain extent taking place with the State libraries of the United States is also going on with the great libraries of other countries. A constant interchange of publications is kept up year after year. In this way the State library continues to increase, not only in the publications which are issued in our own country, but in the volumes which are issued by the governments of other countries. It was, I remember, an estimate made by Dr. Homes himself several years ago, that the State library had received from foreign countries books to a value of not less than $50,000.

I have mentioned this important matter of exchanges in this connection because I wished to give due credit to Dr. Homes for building up this mode of increase. I do not wish to imply that Dr. Homes is entitled to the entire credit. The interchange between the States is a natural and spontaneous growth which has sprung up from the circumstances and relations in which the States stood to each other. The foreign exchanges are, in a greater degree, the result of well directed effort which a number of individuals put forth. Perhaps the most conspicuous of these was M. Vattemere, who spent many years of earnest endeavor to establish a system of exchanges between the libraries of this country and those in Europe. On behalf of the New York State library these endeavors were largely effectual through the support of the late Chancellor Pruyn, who exerted himself freely and

vigorously in extending these exchanges. Many of the most important of the gifts from foreign governments, like the description of patents from the government of great Britain, were obtained by the personal exertions of Mr. Pruyn. Dr. Homes appreciated fully this important source of increase and from the beginning exerted himself to place it upon a firm and permanent footing.

I think it is due to Dr. Homes to make mention at this point of his services in reducing to system the principles which ought to govern the growth of such a library as that of the State. It is plain that libraries must be conducted in accordance with the purposes for which they exist. Only a few libraries of the world can afford to attempt to collect all printed books. Most libraries must lay down certain limitations within which they propose to keep their efforts. The State library was founded for the purpose of furnishing aid to the Legislature, the State officers, the courts of law, and the profession which practices before these courts. In these respects this library differs widely from the large and miscellaneous collections of books which compose such libraries as the Boston Public Library or the Chicago Library. In any case the purchases must be made with reference to the uses to which the library is to be put and the amount of money which may be expected each year to be expended upon it. The limited amount of the annual appropriation for the purchase of books has made it necessary to select certain appropriate lines in which the increase should be made. Dr. Homes gave to this problem his earnest attention, and the directions in which the library has been growing are chiefly such as he has indicated.

My personal relations with Dr. Homes were such that I am sure you will allow me to make reference to them. In addition to his scholarly and professional characteristics, to which I have adverted, he was a charming and entertaining friend. He was exceptionally well informed on a great variety of topics. His extended and intimate knowledge of foreign countries, his thoughtful and careful intelligence in relation to the events transpiring in our own country, rendered him a most interesting companion. It was impossible to encounter him even in the most casual way and for the briefest time without gleaning from him something worth remembering. He was fond of a friendly chat, and was what may be called a most companionable man.

I shall miss him greatly; and you, Mr. Chairman, and you, members of the Institute, will all miss him greatly. He was one of those few men on whom you could implicitly rely, and faith in whom would never be betrayed.

THE TALMUD.

[Read before the Albany Institute, Dec. 20, 1887.]

By Rabbi Max Schlesinger.

Mr. President, Ladies and Gentlemen: — At the suggestion of our honored president I have undertaken to speak to you to-night on the Talmud. This is not an idle statement. It is my plea of "not guilty" to any indictment which you may have to bring against me for my ruthless attempt on your long-suffering patience and forbearance. If in your judgment I should be guilty of the high crime and misdemeanor of boring you, please do not forget that I have an accomplice, and that the responsibility is not altogether mine. I shield myself behind the authority of our president, who thought that the Talmud would be just the thing to interest you. On the strength of this authority I was so bold as to lay here before you a copy of the Talmud. This array of big folios will probably give you the best idea of what the Talmud is. To all appearance the Talmud is simply a very voluminous literary work. Yet it is altogether different from any other literary work of either modern or ancient times. As we shall presently see, it is not so much a literary work as a literary accretion, that grew up slowly and imperceptibly in the course of several centuries. Following the natural law of such accretions it formed first a nucleus around which layer upon layer agglomerated in the course of time. The literature of the Talmud covers the era from about the year 200 before to about 600 after Christ, an era which, as you know, gave birth to the two great daughter religions of Judaism, viz.: Christianity and Mohammedanism. If for no other reason the Talmud will always remain of great interest on this account: that we can trace within its wild recesses and dense literary forests, the fountain-springs out of which these two mighty religious streams came forth.

What was the immediate cause of such a literary accretion? Since the time of Ezra, about 500 years before Christ, when the exiles returned from Babylonia and the second Jewish commonwealth was formed, the Mosaic law was accepted as the common law of the Jewish nation.

But the changed circumstances would not adapt themselves to the old laws. The Mosaic legislation proved insufficient; it required not only interpretation but supplementation. New laws had to be given, new institutions established, which however had all to be based on the precepts of the Mosaic law. These newly established laws, customs and institutions were called the oral law, and this oral law finally gave rise to the Talmud.

We speak of *the* Talmud; but there are *two* Talmuds, the Babylonian and the Palestinian Talmud. Of their difference we shall presently have to speak. They have both in common the nucleus of this immense literary accretion. This nucleus is called the Mishnah. The word is derived from שָׁנָה which in post-biblical Hebrew means both to teach and to learn. Mishnah means what is taught and learned, *i. e.*, instruction, and especially instruction in the traditional laws and customs. At first the Mishnah was taught and learned orally only, for there was a certain prejudice against writing down any portion of the oral law. But in the course of time, when the mass of the oral law had grown so enormously that even the most retentive memory could no longer cope with it, several attempts were made to reduce it to writing. We hear that there existed a Mishnah of R. Akeba, one of R. Meir, two teachers who flourished in the second century after Christ. But it was R. Jehudah, the descendant of Hillel, and great-grandson of R. Gamaliel, at whose feet St. Paul was imbibing his wisdom, who by making use of the work of his predecessors finally succeeded in arranging the Mishnah and writing it down. This was accomplished about 220 after Christ, and though numerous additions and alterations were incorporated long after him the Mishnah, nevertheless, always remained in the shape which R. Jehudah had given it. He divided it into six "Sedarim" or orders; each order into "Mesachtoths," or tracts; each tract into "Perakim" or chapters; each chapter into paragraphs. In succinct, pithy sentences the Mishnah endeavors to embody the sum total of the oral law, which had accumulated from the time of Ezra to that of R. Jehudah Ha-nassi, as he was called, *i. e.*, the prince, a title which indicates the high esteem in which he was held. Such a summing up of the traditional laws, customs and institutions, however, could not interrupt their further development. On the contrary, it became a new stimulus. After R. Jehudah Ha-nassi the Mishnah was made the text for the discussions and debates in the various schools. These discussions are called the Gemara. The word is derived from the Aramean גְּמַר

which means to complete, or to complement. The Gemara is, so to say, the commentary of the Mishnah. It attaches its discussions uniformly to the words of the Mishnah, explains terms and things, wherever necessary, seeks to elucidate difficulties and to verify and fortify the ordinances of the Mishnah by adducing proofs. It endeavors to harmonize discrepant statements, and to refer anonymous decisions to their proper authors. At times it takes occasion to trace the plan adopted by the Mishnah in arranging and grouping its contents. Though clinging to the Mishnah it never loses sight of extra-Mishnaic compilations, made before or after R. Jehudah Ha-nassi, in which the same subject is treated, and it discusses at length, whether and to what extent both may be brought into agreement. Then it formulates new ordinances, these being in part based upon previous decisions, in part distinct and independent productions. Finally, it reports in full the harmonious or divergent opinions and controversies that took place in the academies in respect to all these and kindred subjects. Thus the Gemara is a vast and comprehensive commentary on the Mishnah. But it is still more. It has sedulously gathered, without any reference to their connection with the Mishnah, all the utterances, wise or otherwise, which for centuries, had dropped from the lips of the great masters; whatever traditions were preserved concerning their life and actions; whatever bears directly or remotely upon the great subjects of religion and ethics. Thus it contains legal enactments, homiletical exegesis of Scripture, apothegms, moral maxims, popular proverbs, parables, fables, tales, accounts of manners and customs, both of the Jews and other nations. Beside these, there are also numerous medical, mathematical, astronomical, scientific and historical data.

All this was, at first, taught and handed down from one generation to the other orally only, until at length, when its vastness had become almost crushing to the memory, and when at the same time adverse political circumstances thinned out the schools, it was deemed advisable to write down the Gemara as well as the Mishnah. In Palestine the political horizon darkened first and, therefore, the urgency of securing the traditional treasures by writing them down, was felt sooner than in Babylon. Toward the end of the fourth and the beginning of the fifth century, the academy of Tiberias, founded by R. Jochanan, was busily engaged in collecting and writing down the discussions, *i. e.*, the Gemara, of the Palestinian schools, together with the Mishnah. Both combined were called the Talmud. The word Tal-

mud is derived from the Hebrew "lamad," to learn, to study, and may best be rendered by the Latin "doctrina."

In Babylonia the same want was felt about a century later. R. Abina II, the head of the academy of (Sora), who flourished between 473 and 499, made the beginning with this great and tedious work, and R. Assa and his successors, called the Sabaraim, *i. e.*, the testing ones, completed it (as far as it is completed) during the first half of the sixth century. They added to the Mishnah their Gemara, *i. e.*, the discussions that took place in the Babylonian academies. The two Talmuds, though they do not differ essentially in their contents (for the discussions in both are on the same subjects), differ altogether in their language. The language of the Mishnah is a post-biblical Hebrew; that of the Palestinian Talmud is the western Aramean dialect which is more akin to the Hebrew, somewhat like that of the Targumim, the Aramean translations of the scriptures; while the Babylonian Talmud speaks the eastern Aramean language, more akin to the Syrian than the Hebrew. Both Talmuds are not quite complete, that is to say, to some parts of the Mishnah the Gemara is missing. As far as the Babylonian Talmud is concerned the missing parts of the Gemara were probably never written. The Palestinian Talmud, however, being less known to the occidental Jews, undoubtedly extended over many other parts of the Mishnah than the existing manuscripts and editions contain. It is a strange freak of history that the European Jews received their traditional sources by way of Babylon, not from Palestine, and thus it came to pass that the Babylonian Talmud was much better known and more sedulously studied than the Palestinian Talmud.

In regard to the contents of the Talmud, the Talmud itself distinguishes two component parts, viz.: first, the Halacha, and second, the Hagada. The Halacha treats of laws and regulations that bear upon the practice of religion. These include the ritual and ceremonial laws, and also the chief heads of Ethics. The word Halacha is derived from "halach," to walk, and means the way to walk or live, *i. e.*, the established custom or law. The other part is the Hagada, derived from the Hiphel form "higid," to announce, and means that which is narrated, preached or announced. It contains all the many parables, fables, maxims, proverbs and every thing that is of no general and binding authority, and stands there only as a mere individual utterance. Heinrich Heine describes both in his own inimitable way (Romanzero, Song Juda Halevi). I will attempt a paraphrase: "The Halacha, the intellectual arena, where the dialectic athletes (of old Babylon and Pumpeditha) wrestle, run and wrangle for the palm of victory spiritual." The Ha-

lacha is indeed the arena which resounds with the logical combats of intellectual giants, who engage in settling disputed questions. The views of different teachers of former ages are scrutinized and compared, the evidence impartially placed in the balance, all possible arguments for or against are carefully put into this scale, until a decision is finally reached, or the case remains undecided. There is a peculiar fascination in watching and following these intellectual combats. But it must not remain unnoticed, that quite often the Talmudical athletes engaged in these combats not simply to find the truth, but to show their intellectual strength, or to defeat their opponents; that the discussion, instead of simply leading to high thinking, is a useless and profitless hair splitting and spinning out of impossible assumptions to the finest gossamer thread.

The Hagadah Heine describes: "The Hagadah, howsoever, | Will I call the garden beautiful | Where in high phantastic manner | Blossom forth the ancient legends | Angel stories, myths and sayings | Touching histories of martyrs | Hymns and songs and wisdom's fruitage | Hyperboles not seldom funny | All, however, fervent, faithful, glowing, glittering with ardent grace."

To give you a better idea of the contents of the Talmud, I have selected a few examples of both the Halacha and the Hagadah. Of special interest, perhaps, is the civil and criminal law of the ancient Jews, as laid down in the Talmud. There were three kinds of courts. The lowest court, consisting of three members, the presiding judge and two associate judges; the higher court, called the minor Sanhedrim, had twenty-three members; and the highest court, called the great Sanhedrim, had seventy-one members. This latter court was the highest national authority and had finally to decide all questions, religious, legal and political. They could summon before their tribunal the highest state officers, even kings and princes. The members of this court were selected from the high-priestly families, the elders and the scribes, and wherever the New Testament mentions the priests, elders and scribes, it refers to this court. Every member of this court had to be distinguished by learning and spotless reputation as to character. Aside from this, age and physical condition were considered. Every member had to be at least thirty years old and not older than seventy. A man with physical ailments, or deformities, was disqualified, as such misfortunes were supposed to sour the temperament and embitter the heart. An unmarried or childless man was also debarred, as such were supposed to have less sympathy with their fellow-men than married men blessed with children. All cases of civil law were adjusted

in the lowest court of three judges. But before the court entered into the merits of any case, it was their duty to try every thing in their power to persuade the parties to an amicable settlement among themselves. "When," says the Talmud, "is the Psalmist's ideal realized —'Mercy and truth are met together, righteousness and peace have kissed each other?' When the contending parties settle their difficulties amicably among themselves, before they submit them to the court." The parties that appeared before the court had to be dressed alike. It was not allowed that one should be arrayed in costly garments, the other poorly. The judges are repeatedly warned not to be partial to the rich because he is rich, nor to the poor, because he is poor. "He who takes unjustly the property of one man and adjudges it to another, be he poor or rich, will have to pay for it with his own soul before the judgment-seat of God." "As long as the parties are before thee (the judge), consider them both guilty; but when they have received thy judgment and leave the court, both shall be innocent in thy eyes." "Woe to the judge who is convinced within his own mind of the justice or injustice of the case, and yet persuades himself that, according to the evidence of the witnesses, he has to give judgment against his own conviction." "Whenever the judge renders his decision, he shall imagine a sword pointed at his heart ready to pierce it, in case of an unjust judgment." These are maxims of the Talmud. The procedure of examining the witnesses is prescribed thus: All the witnesses are first to be assembled in one room and solemnly exhorted. You have to represent to them that false witnesses are held in contempt even by those who suborn them. Then all the witnesses have to leave the room and only the oldest and most respectable of them shall remain for examination. He is accosted, "Say on, how do you know that this A. owes to that B.?" If he says, "A. himself told me so," or "another man told me so," his evidence is inadmissible, unless he says "A. has acknowledged before me and other witnesses that he owes to B. this and this sum (200 sus)." Then he is sent out and the other witnesses are called in one after the other. In case their evidence agree, judgment is rendered; if not, the case is dismissed.

Still more scrupulous was the mode of proceeding in criminal cases. Every criminal case had to be brought at least to the minor Sanhedrim, consisting of twenty-three members. Circumstantial evidence was excluded and even the confession of the accused to the crime committed was not accepted as evidence of his guilt. The judicial maxim was "no man can declare himself a sinner," the same as "no man can incriminate himself," only it was carried to a still further extent. The

witnesses before their examination were to be thus accosted: "Perhaps you only suspect the man of the crime, or you have heard of it from a trustworthy source; perhaps you do not know that we shall search you and cross-examine you. Consider that this is not a mere matter of mine and thine; it is a question of life and death. If a man has wronged his neighbor by bearing false witness in matters of mine and thine, he may atone for himself, make restitution and be forgiven. But in matters of life and death not only the blood of the innocently slain, but the blood of all his possible posterity, would come upon the false witness. Of Kain, the slayer of his brother, it is said, the voice of **thy brother's blood cries up to me.**

"'Damim' blood is used here in the plural to teach you that he spilled not only Abel's blood, but also that of all the posterity he might have had. Or the plural is used, because the blood bespattered stones and wood, and every stone and every piece of wood now cries up against the slayer. Then remember, only one man was created. This is to teach you (1) that whoever destroys the life of *one* man, is considered by the Scripture as if he had destroyed all mankind; but whoever saveth the life of one man, is considered as if he had saved all mankind; (2) that one man may not say to the other, my father is better and more noble than thine, but that they may all live in peace and good will with each other; (3) that the Sadducees may not say, there are various powers in heaven, of which each created its own world; (4) that God's greatness be thereby made manifest. A man takes many imprints from one seal and they are all exactly like each other, but God Almighty made all men with the seal of Adam, yet there is not one man perfectly like the other. Therefore every man may imagine, on my account the world was created, *i. e.*, no one shall think lightly of himself. Now, you may perhaps think, why should I go to all this trouble and endanger myself (by being a witness)? Remember, that it is said (in Scripture) 'if a man has seen or learned of any wrong and testifieth not, his guilt shall be upon him' (*i. e.*, it is the solemn duty of everybody to serve society in the capacity of a witness). Or perhaps you may say, why should we bring the blood of this man upon us? Remember, that it is said, 'Thou shalt put away wicked**ness out of your midst.'"**

After these representations every witness is separately to be examined in regard to the following seven questions: (1) In what seven years' cycle did it happen? (They reckoned by jubilees of fifty years, consisting of seven cycles of seven years.) (2) In which year of the cycle? (3) In which month? (4) Which day of the week? (5) At

what time of the day? (6) What hour? (7) What place? Then they were asked, "Did you know the murdered man and the murderer, and did you warn the latter before he perpetrated the deed?" If to any of these questions the witness answered negatively, or simply said, "I don't know," his evidence was rejected. Not everybody was accepted as a witness. Relatives could not be witnesses either for or against (Sanh. iii, 3). Gamblers, usurers, those who bet on the flight of pigeons, and those who dealt in the produce of the seventh year (which, as you know from the Bible, was a year of rest to the land and whatever it produced spontaneously belonged to all who took possession of it) were not admitted as witnesses in any court. Judgment could never be rendered on the day the examination of the witnesses closed; it had to be postponed to the next day. In the meanwhile the judges met either in their houses or in the open court, and deliberated, sometimes during the whole night. While these deliberations lasted, they had to abstain as much as possible from eating and drinking. The next day the judges convened and each had to give his opinion separately, beginning with the youngest and least reputed, that he be not influenced by the opinion of his superior in either age or learning. He who condemned the accused could change his vote before the final decision was rendered to an acquittal, but he who acquitted could never change his vote again. In civil cases a simple majority of the judges either acquitted or condemned; in criminal cases a majority of one against the accused set him free; for condemnation a majority of at least two was required. Very seldom it must have occurred that a man was put to death, for the Mishnah (Macoth 1, 10) says: "A court which, within the space of seven years, has condemned to death more than one man, is called a murderous one." And R. Tarphon and R. Akeba, two of the most reputed teachers of the second century (when the Roman government had assumed the judicial power and administered justice or injustice as the case might have been), said: "If we had been members of a court, judging over life and death, no man would ever have been executed, for we would have asked the witnesses questions until their testimony was invalidated." This, however, does not imply that they were willing to let loose upon society the worst evil-doers, for the law provides that a murderer who could not be convicted on account of the insufficiency or weakness of the evidence, was to be kept in close confinement and fed on bread and water until he died.

And now let me give you a few specimens of the Hagadah. First, the story of Alexander and the king of India (Jer. B. Metsia 88 c. Ber R. Par.

33). Alexander on his conquering march had come to the king of Kasi, which is in India. When entertained by the king, he found on the table nothing but bread made of gold, and all the dishes were filled with silver. "What do you mean?" said Alexander; "do you think we feed on silver and gold?" "Yes," said the king, "we thought so. For have you not bread and meat in your own country? why then have you taken this great trouble of coming with your mighty army this great distance?" "Oh, I have come to learn of your customs." While they were yet talking two men came before the king for judgment. One had bought from the other a piece of field with all that was on it. When he was ploughing the field he found in it a hidden treasure, which he wished to return to the man he bought the field from. This man, however, would not accept it, for he said, "I sold you the field and all that is in it and on it." Thus they were quarreling with each other. Then the king asked one of them, "Have you a son?" and he said, "Yes." He asked the other, "Have you a daughter?" and he said, "Yes." "Then let *your* son marry *his* daughter, and let the treasure be their dowry." Thereupon Alexander burst out laughing. "Why do you laugh?" said the king, "did I not render a just judgment? How would they have disposed of such a case in your country?" "In our country," said Alexander, "both would have been imprisoned or slain for quarreling, and the treasure would have been confiscated into the king's treasury." Thereupon the king asked, "Does the sun shine in your country?" And Alexander said, "Yes." "Does it rain in your country?" Alexander said, "Certainly." "Are there any animals in your country?" "Of course," said Alexander. "Ah, now I understand," said the king, "in your country the sun shines and the rain falls only on account of the animals. Men do not deserve these blessings of heaven."

Let me give some parables: THE EQUAL REWARD (Jer. Ber. 5 c). R. Bun bar Chiya died when still very young, and R. Sera stood up to speak at his funeral. He took for his text (Eccl. 5, 11), "Sweet is the sleep of the laborer, whether he ate little or much." "This is like unto a king," he said, "who had many laborers, among whom one distinguished himself by his industry and skill, so that the king went up to him, relieved him of his task and called him to himself, enjoying his company. When the evening came, all the laborers, among them also the skillful, were called to the king, and all received the same wages and the same reward. Thereupon the other laborers murmured and said: 'This man has worked only two hours, while we have toiled all day, and yet he receives the same reward.' But the king silenced

their murmurs, saying: 'This man has done more in the two hours than you, while working all day.' Thus R. Bun bar Chiya has done more in his twenty-eight years than many another industrious scholar, who reached one hundred years."

BODY AND SOUL BEFORE THE DIVINE JUDGMENT SEAT (Sanh. 91, etc.). Antoninus once said to Rabbi: "Body and soul will easily clear themselves before the divine judgment-seat. The body will say 'My soul alone has sinned, for since she departed from me, I am in my grave like a stone.' And the soul will say, 'My body alone has sinned, for since I am delivered from it, I am incapable of sin.'" Then Rabbi said: "Come, I will tell you a parable. A king once had a beautiful garden, and in it he placed two watchmen; one was lame, the other blind. 'I see some luscious fruit,' said the lame to the blind, 'come, I will ride on you and get them.' So they did, and both enjoyed the stolen fruit. After a while the king came and noticed the depredation. He asked the lame one, 'How is this, who took it?' But he excused himself, saying: 'I am lame, I could not do it.' He asked the blind one, 'How is this, who did it?' He said, 'I am blind, I cannot see it.' What did the king? He set the lame one on the blind one and judged them both together. Thus, God Almighty will judge both body and soul together."

THE WISE AND THE FOOLISH (Sabb. 152 b). A king distributed among his servants royal garments. The wise preserved them most carefully, while the foolish soiled them by their daily groveling labor. Once the king asked for the garments. The wise ones brought them to the king clean and resplendent, as they were given to them, the foolish brought them soiled and torn. The king rejoiced over the wise, but his wrath kindled over the foolish. In regard to the wise he ordered that their garments be returned to the royal treasure-house, while they may enjoy themselves in the king's presence; in regard to the foolish, he ordered that their garments be brought to their houses, and they be put in prison.

THE ROYAL BANQUET (Sabb. 153a). R. Eliezar taught: "Repent one day before thy death." Thereupon his pupils said, "No man knoweth the day of his death." "Ah, for this very reason," said the Rabbi, "man ought to improve the day he lives, as he may die to-morrow. Be ever prepared and ever repentant, for it is said (Eccl. 9, 8), 'Let thy garments always be white, and let not thy head lack ointment.'" R. Jochanan applied to it this parable: A king had invited his servants to a banquet, but he did not tell them when they were to come. The wise arrayed themselves in beautiful gar-

ments and waited at the entrance of the king's palace, for they knew that in the king's palace no preparations were necessary and they might be called at any moment. The foolish ones followed their daily pursuits, because they thought the banquet could not take place without some great preparations. Suddenly the servants were summoned. The wise ones appeared before the king in their pure and beautiful garments, the foolish ones in their soiled garments. Over the first the king rejoiced, over the others he sorrowed. He said, "Those who came in pure garments shall enjoy the banquet, those who came in soiled garments shall stand by and look on."

Let me give you two of the many fables. THE FOX AND THE FISHES (Ber. 61 B). When Hadrian had issued the decree that no Jew should either teach or learn from the sacred books at the peril of his life, Papus once found R. Akeba teaching an assembly. Papus said to R. Akeba, "Are you not afraid of the government?" Thereupon R. Akeba said, "Come, let me tell you a fable: Once upon a day, the fox passed by a river and saw the fishes in great anxiety. He asked, 'What is the matter?' They told him, 'Oh, the anglers are after us, and spread their nets to catch us.' 'Then,' said the fox, 'I would advise you to come to me on dry land, and we will live together in peace.' 'Are you the fox, who is called the wise?' they replied. 'You have spoken very foolishly. If we are not secure here, in our natural element, how would it be with us if we should leave it?' So with us, if we are imperilled while we are living according to the law, of which it is said, 'it is thy life, and the length of thy days,' how much more would we endanger us, if we should leave it."

THE SNAKE AND THE BACK BITER. (Arach. 15, C). Once upon a time the animals asked the snake: "Say on, the lion tears because he is hungry, the wolf kills and eats; but what good is it to thee to bite and kill?" "Oh," said the snake, "why do you ask me? ask the backbiter what pleasure it gives him to bite and injure."

Only a few of the thousands of maxims I will quote. (B. Metsia 58 b). "He who puts his fellowman publicly to shame, has to consider himself as if he had spilled his blood" (Rosh. Hash. 17 a). "He who forgives offenses, shall have his sins forgiven by God" (Tanith 20 a). "Let men ever be meek and yielding as the reed and not hard and haughty as the cedar" (B. Mets. 49 a). "Let your 'yes' be a truthful 'yes' and your 'no' be a truthful 'no'" (Chullin 94 a). "Man shall never deceive his neighbor though he be the worst heathen" (Arach. 16 b). "He who speaks slanderously commits a sin

which cries up to heaven" (Sota 42 a). "The hypocrites shall never see God" (Succa 49 a). "Humanity is preferable to piety."

The Rabbis of the Talmud thought very highly of woman. They say (B. Metsia 59 a): "A man shall ever diligently strive to honor his wife; for God's blessing is vouchsafed to house and home only on account of the house wife" (Yehamoth 62 b). "He who loves his wife as himself, honors her more than himself; of him it is said, he is assured that peace shall dwell in his house" (Sanhedr. 22 a). "He whose wife has died is to be pitied as he who has seen God's sanctuary being destroyed before his eyes" (Yehamoth 63 a). R. Chiya had a wife, who aggravated him continually. Nevertheless, whenever he saw any thing nice and beautiful in the market, he never failed to buy it and bring it to her. He was asked, "Why, your wife aggravates you, and embitters your life, how can you be so attentive to her?" But he replied, "It is enough that our wives bring up our children and preserve us from going astray." Yet, R. Chiya felt keenly how his life was spoiled by his uncongenial companion. When Rab took leave of him he blessed him, saying, "May God preserve thee from what is worse than death." "Is there any thing worse than death?" he asked. "Aye, is it not written, 'bitterer than death is an evil woman.'"

"The Hagada," says the learned Prof. Dr. Aug. Wünsche, the first man who attempted the enormous task of translating it into German, "the Hagada, this beautiful child of the Jewish spirit, nourished by the fertile Jewish imagination, grew up to conquer the heathen world. She, who most of the time, was treated very stepmotherly by the Rabbis, became the pet of the world. Do you ask, how so. Remember, that the founder of the Christian religion, while rebelling against the unbearable yoke of the Halachic law, mastered the Agada to such a degree, that he understood to speak to the people in that natural imagery which took possession of their heart and mind. Thus, the Hagada, so often slighted and neglected by the Rabbis, became the **nurse and teacher of Christianity.**"

PROFIT-SHARING.

By FREDERIC G. MATHER.

[Read before the Albany Institute, March 18, 1890.]

Profit-sharing is a term applied to any arrangement whereby labor is rewarded in addition to its ordinary wages, or, in place of wages, by a participation in the profits of the business in which it is employed. The term is somewhat synonymous with the word "co-operation." The latter is divided, naturally, into distributive and productive. Distributive co-operation (known as co-operation proper) aims to save money to consumers by dispensing with middlemen. Rochdale, in England, and Brook Farm, in Massachusetts, are conspicuous examples. A most notable instance of success is shown by the Beverly Co-operative Association, organized in Massachusetts in 1875. College co-operative societies are represented at Harvard and Yale and the University of Michigan. Some of them sell books, crockery and tennis goods, and they have direct connections with town tradesmen.

Profit-sharing is the productive, or participative branch of co-operation. It should always be known by that term, and not be confounded with distributive co-operation. In 1844 the Paris and Orleans Railway Company adopted the principle of profit-sharing. Between 1844 and 1882 about twelve million dollars were distributed as profit dividends among the employees, while the wages paid to them were equal to those paid by roads that gave their employees no share in the profits; and there is good reason to believe that at the same time the dividends to the stockholders were at least as large as they would have been had there been no profit-sharing.

Among foreign works on the subject, those of Dr. Böhmert, of Dresden, and Dr. Fougerousse, of Paris, are the most valuable. The latter declares that the simplest system is that which distributes this share in ready money at the close of each year's account, without making any conditions as to the disposal of the sums so paid over. This mode of proceeding is adopted by a very limited group of firms. The most important among them is the piano forte establishment of M. Bord, in Paris. Participation was introduced in 1865 in conse-

quence of a strike, on the following basis : After deduction from the net profits of interest at ten per cent on M. Bord's capital embarked in the business, the remainder is divided into two parts, one proportional to the amount of interests on capital drawn by M. Bord ; the other, to the whole sum paid during the year in wages to the men. The former of these two parts goes to M. Bord ; the latter is divided among all his employees who can show six months' continuous presence in the house up to the day of the annual distribution. The share obtained by each workman is proportional to the sum he has earned in wages, paid at the full market rate during the year in which the division of profits is made. The number of M. Bord's employees is a little over four hundred, and the sums he has paid in labor dividends average about fourteen per cent on the men's earnings in wages. In another instance profit-sharing was introduced (nearly forty years ago) under the auspices of M. Alfred De Courcy, into one of the most important insurance companies of Paris, the Compagnie des Assurances Générals. Five per cent on the yearly profits realized by the company is allotted to its staff, which numbers about two hundred and fifty employees of all grades, whose fixed salaries are at least equal to those paid in non-participating insurance offices in Paris. No part of this share in profits is handed over in annual dividends. Each successive payment is capitalized and it accumulates at four per cent compound interest until the beneficiary has completed twenty-five years of work in the house, or sixty-five years of age. At the expiration of this period he is at liberty either to sink the value of his account in the purchase of a life annuity in the office, or to invest it in French government or railway securities. Should he decide on the investment as against the life insurance, he is allowed to draw only the annual dividends arising from it, as the company retains the stock certificates, and not till after his death will it abandon its hold on the principal in favor of such persons as he may designate by will to receive it. Leclaire, a house-painter, tried the system among his employees. He finally had his establishment incorporated as a co-operative house, and as such it still exists. Each of the two heads of the firm receives $1,200 in compensation for his work as manager. The capital is allowed an interest of five per cent. Then one-fourth of the profits goes to the two managers, one-fourth to a mutual benefit society and insurance fund and one-half to the laborers, who receive shares proportionate to their wages. The system is not only a financial success, but the painters of the establishment are among the best and most thrifty workmen in Paris. It is said

that over one hundred continental firms are now working on a similar participatory basis. The principle has been introduced with good results into agriculture; into the administration of railways, banks and insurance offices; into iron-smelting, type-founding and cotton-spinning; into the manufacture of tools, paper, chemicals, matches, soap, cardboard and cigarette papers; into printing, engraving, cabinet-making and plumbing; into stockbroking, bookselling, the wine trade and haberdashery. The establishments differ in size and importance as much as they do in the character of the industries they pursue, from the paper-mills of M. Laroche-Joubert, at Angouleme, with their one thousand five hundred workmen, to the establishment of M. Le Noir, at Paris, with its forty house-painters.

The most notable scheme of profit-sharing recently tried in England is that of the South Metropolitan Gas Company of London, one of the large corporations threatened with a strike, as a sort of sequence to the successful campaign of the dock laborers. The company proposes to pay an annual bonus, based upon a sliding scale, etc., regulated by the price paid for gas by the public. At the present price the bonus would amount to five per cent on the wages of the twelve months ending on the 30th of June, 1890. In addition, to give the system a start, and in order that the workmen shall derive a substantial benefit at once, the bonuses are to be calculated for three years back. The men who have been in the regular employ of the company for the past three years will thus have sums varying from $25 to $30 placed to their credit at once. It is stated that if all the workmen take advantage of this offer it will cost the company about $60,000 a year, all of which is a clear gain to the men over and above their regular rate of pay. And yet, strange to say, the offer has not been accepted, although there are, perhaps, more than one thousand men ready and anxious to accept it; but they are prevented from doing so by the tyranny of their union, which, confident in its strength, wishes to dictate even better terms.

Another late example comes from a factory of wood-pulp in Norway, where about sixty men are employed. The gross profits of the first year amounted to about $70,000, from which $3,000 was taken out for interest on the capital, and $15,000 for working expenses. The remainder has been distributed to the men. Nearly all of them have used the money in buying houses for themselves, thus leading to contentment and industry.

In the United States, profit-sharing dates from the time when the whaling ships of New England first started out "upon shares" to all

in any way concerned in the capture. But the form of profit-sharing, whereby the worker has somewhat to do with the capital, is of more recent years. Perhaps the oldest example of productive co-operation is the Somerset Co-operative Foundry Company of 1867, which has been fairly successful. The origin of all our co-operative concerns shows that they arise from a strike, when men are left to shift for themselves. There are many boot and shoe co-operative companies that have met with great success. Co-operative creameries arose because farmers were swindled by middlemen; and in self-defense they pooled their dairy products and turned out butter and cheese. They serve a useful purpose and they must prosper, because they have that special advantage which a limited production gives.

When profit-sharing and wages are considered together, the matter is more complex. The Lynn Knight of Labor Co-operative Boot and Shoe Company, now (1890) not quite four years old, marks the newer movement. In 1887 it had a capital of $9,000. It sells its goods in part to the Knights of Labor, but as it makes excellent goods, its wares are in fair demand. Profits are divided in this way: ten per cent goes to the sinking fund; five per cent interest is paid on the capital stock; ten per cent of the remainder goes to the Knights of Labor Association for a co-operative fund to be used in assisting co-operative enterprises; thirty-five per cent goes to capital, and thirty-five per cent to labor, in proportion to wages. The Cushman Shoe Factory at Auburn, Me., has just distributed four per cent upon wages earned. The business was larger by $150,000 under the profit-sharing system than before. This was the result of the interest taken by the men in their work, as is best described in the words of the report of their committee: "How much could you contribute to the profits of the business? You had provided for the firm, now what was to be done to insure you a good profit? Every cent's worth of waste lessened your profit. Every cent saved increased it. Every mite of poor work returned (and there has been a good deal the past year) has been the diminishing of your dividend. The dividend might have been one per cent more if we had all realized just how much rested with us. We have seen time and again ten cents wasted by one person in a day. 'Oh, that is nothing,' you say. Well, if every one of the seven or eight hundred waste that amount in a day, is that any thing? Of course this does not happen. But you can all see how a mite from all would count up big at the end of a year."

The second largest granite quarry in the United States, the Westerly, of Rhode Island, has made a profitable arrangement of

this sort. It was agreed that at the end of the year the net income should be divided into three equal parts — one for the laborers, another for the company and one for a reserve fund. The labor dividend should be paid annually and before the dividend to capital. No officer, overseer, clerk or sub-contractor must share in the dividend. The true value of all labor contributed shall be determined by the amounts earned and credited to each workman as wages for labor performed during the year. Accounts shall be examined by auditors mutually agreed upon, and laborers arbitrarily discharged or necessarily deprived of work shall not be debarred from receiving their share of the dividend. Disagreements shall be settled by arbitration and a bill of prices shall be mutually agreed upon on or before January 1 of each year. No reduction of wages shall be made to affect any contract on hand, and in case of an increase of rates on any contract, the difference may be adjusted in making up the dividend. A leading firm of clothiers in New York city explained its plan to its employees in this way: "The purpose is to set aside a certain percentage of our net gain as ascertained at the end of the year, and with that sum declare a dividend upon the total amount of wages paid to those who work under our own roof. Whoever has earned even so much as a week's wages will participate, provided he was not discharged for cause. Upon the basis of our last year's business you would have received nearly five per cent upon the total of your year's earnings. In other words, the man who drew $20 per week, or $1,040 during the year, would have had a check for nearly fifty dollars. We make no promises on the score of amount. We hope this year will yield better results. It may not do so well. The determination of that is largely in your hands. If any thing is made, whatever it may amount to, your share shall be faithfully distributed; you can trust us for that." On this basis three per cent was distributed in 1888 and five per cent in 1889.

The leading merchant of Philadelphia, John Wanamaker, two years ago issued a circular, stating that all who had been in the employ of the house for seven years, and such others whose term of service shall hereafter reach that length of time, are to participate in the profits of the business. All employees who do not come in the seven-year class are to have added to their regular salaries a sum each week graded by their sales. In the clerical, packing, invoice and various offices, a civil service system is to be strictly followed in making promotions and advancements. The record of each person in the employ of the house will be carefully kept and will govern all

changes. There will also be a special honor list, "for the more rapid preferment of those showing marked business ability, rapid improvement, diligence, economy and usefulness." The distribution for the first year was $109,439.68. The employees of the store were called together at the expiration of the second year, in May, 1889. At that time $46,082.29 were paid, which, added to $58,263.29 already paid, made a total of $104,345.68. The following statement was made by the proprietor: "In two years we have paid the usual salaries and exactly $213,785.39 more by this free-will distribution. Not one person, to the best of my knowledge and belief, would have had any larger salaries had this plan of distribution not been in force; so that it is out of our pockets into yours, and without any obligation on our part except good will and interest in the welfare of our good people. Under a system of monthly examinations of individual records, all our clerks have had proper consideration according to merit, and perhaps a few salaries have been reduced as above value of services, while many have been advanced without solicitation. This is the present and future policy of the house. The checks given out to-night might all have been larger, and it is a disappointment to me that they are not. You have it in your power, by your enthusiastic and earnest efforts, to increase or diminish what the firm has set aside for this distribution. I wish to do two things by this plan: First, to give actual proof of heartfelt interest to our people; second, to solidify the people into one mighty and perfect force to increase the business for the benefit of themselves and their employers."

In May, 1889, the Bourne Mill Corporation, of Fall River, Mass., adopted a plan to provide sharing with its employees. It was proposed that every man, woman and child continuing in the employ of the company, from July, 1889, to January, 1890, should receive some share of the profits, to be paid in cash on the 10th day of February, 1890, in proportion to the wages earned for the whole six months, and that the total amount divided shall not be less than six per cent of the amount of cash dividends declared and paid to the stockholders during the same time. The only condition was faithful and continuous service, except on account of sickness or any other sufficient reason. A well-known publishing house in Chicago has tried the profit-sharing system for several years. About twelve years ago, when the capital stock of the firm was $200,000, it induced its foreman and heads of departments to buy five shares of stock at par, to be paid for at the rate of not less than $1 per week. Notes bearing six per cent interest were accepted when the employee did not wish to pay cash.

A block of five shares more could be purchased at par whenever the first block had been paid for. As the stock advanced in value all availed themselves of the option. Eight years ago, when the capital stock of this house was increased to $1,000,000, the oldest and most faithful workmen were taken in as partners; that is, allowed to buy stock to the aggregate amount of one thousand shares. Out of a total force of six hundred men about fifty have already become partners. The results to the firm are: Great prosperity, largely due to increased zeal and activity among stockholding employees; greater permanency and a more watchful care to prevent waste of material and of time on the part of non-shareholders. The results to the employees are increased thrift, economy and sobriety and a greatly increased self-respect; also profits to the original ten-share stockholders amounting to sixty per cent per annum, so that many of them have become property-owners, worth from $20,000 to $50,000, and twelve per cent annual profit to the later shareholders, so that many of them are now worth from $10,000 to $20,000. Their co-operative stock is above par, but, of course, after they had made the first thousand dollars, other profitable investments helped to swell their fortunes. An enterprise, similar to the old whaling system of profit-sharing, was entered into by the menhaden fishermen of New Jersey in 1889. A firm of tinmakers in Chicago has declared a dividend of seven and seven-tenths per cent upon earnings, and a manufacturing company of St. Louis, five per cent. The stockholders of the Toledo, Ann Arbor and Northern railroad have informed their men that in any dividend year each of them (except the president) who has been five years employed shall receive a dividend upon his wages just as though his total year's earnings were so much stock. The workmen of Proctor & Gamble, soapmakers, of Cincinnati, have accepted a proposal that profits above interest on capital shall form a surplus fund to be divided between employers and employed in the proportion of capital invested to wages earned. Pillsbury & Co., of Minneapolis, the largest milling firm in the west, have just finished a division of $40,000 among their employees. This has been made in pursuance of a profit-sharing plan adopted four years ago. For two years there was no money divided, but the third year was a profitable one, and the firm kept its promises. Profit-sharing in Minneapolis has also raised the cooper from a wandering mechanic to an important factor in that busy community.

Of course failure has attended many experiments in profit-sharing. The Co-operative Dress Association (Limited), established in New

York city some years ago, was hardly a co-operative concern — even of the distributive kind.

The latest experiment in profit-sharing on an extensive scale is one that was announced in January last by Alfred Dolge, the largest maker of felt shoes in the United States. His factory is at Dolgeville, N. Y. The proposition may be briefly stated in this way:

"In order that the employees may receive a share of the net earnings of the business, over and above their wages, the house of Alfred Dolge has, after several years' experimenting with a pension and life insurance plan, formulated rules and regulations for the just distribution of such net earnings among its employees, to take effect on January 1, 1890. There shall be three classes for this distribution: First, pension; second, life insurance; third, endowment. The share of the net earnings that is to be set aside every year shall be calculated upon the positive results of the records of the actual work done by the employees. Against this distribution account the amounts paid for life insurance under the provisions of the insurance law and the amount necessary to maintain the pension fund are to be considered fixed charges. The substance of the law is as follows: First, *Pension:* Every employee over twenty-one years of age and not over fifty is, after a continuous service of ten years, entitled to a pension, in case of partial or total inability to work, at the rate of fifty per cent of his wages, after ten years' service; sixty per cent, after thirteen years' service; seventy per cent, after sixteen years; eighty per cent, after nineteen years; ninety per cent, after twenty-two years, and one hundred per cent, after twenty-five years. In case of accident while on duty, or of sickness contracted through the performance of duty, each employee shall be entitled to fifty per cent of his wages at any time previous to the completion of ten years' service. The pension is in no case to exceed $1,000 a year. Second, *Insurance:* Every employee, having been in the employ of the firm at least five years continuously, after twenty-one years of age, is entitled to a life insurance policy of $1,000; on completing the tenth year of continuous service, to a second policy of $1,000; and after the completion of the fifteenth year of continuous service, to a third policy of $1,000. Third, *Endowment:* Every employee over twenty-one years of age in the employ of the house for five consecutive years, shall be entitled to an endowment account upon which he will be credited each year, according as the manufacturing record shows that he has earned more than has been paid him in the form of wages. If, through gross carelessness, any employee has caused the house a loss, such loss will be

charged against the above account. Against this account also any employee may obtain a loan not exceeding the amount of his credit by giving good security."

Neither of these laws impairs the right of the house to discharge an employee for any cause or reason, or the right of the employee to quit **at any time and for any cause or reason.**

It is evident, from the instances given above, that there are three general types of co-operation, or profit-sharing, in manufacturing. The first of these is strictly co-operative, no wages being paid, the gross profits being divided upon some agreed plan between proprietors and employees. The result of this plan has almost invariably been failure. Employees like to share in the profits, but they want a certainty of weekly or monthly wages as a basis. The second plan is to have the employees hold stock, and receive the same wages that are paid in non-co-operative institutions for the same work. This plan has obvious advantages over the first and has been successfully carried out in numerous instances. The stock owned by the employees was in some cases purchased outright; in others paid for gradually out of weekly earnings; and in others acquired by the application of profits voluntarily assigned to them by employers. The third plan is to divide among employees a certain percentage of the profits in proportion to the wages earned. This is the simplest plan and the one more generally adopted. It enables employers to retain full and unquestioned control of their business, and when carried out in good faith assures a division of actual profits between the labor and capital employed. Substantially, this plan is in operation in many establishments in this country and Europe, although no two of them, perhaps, are precisely alike. As such an agreement would necessarily be terminated if a strike occurred, strikes are rarely indulged in; and as the employees are vitally interested in making the profits as large as possible, they work with greater care and cheerfulness. Some employers who have adopted this plan claim that their profits are increased instead of diminished by the division of profits, owing to the better quality and amount of work secured. No one plan, however, can be successfully applied to all kinds of manufacturing business. Whoever earnestly desires to carry out, in whole or part, the principle of co-operation, or profit-sharing, can, with the suggestions made, find a way to do it, and, if he is not discouraged by the difficulties almost sure to be encountered, it will probably be a success in the end. If every factory were organized under the profit-sharing method, there would be

great inequality in the earnings of workmen in the same factory, and still greater inequality in the earnings of men in different factories. In some shops men would receive large dividends; in others, equally good, and perhaps better, workmen would get nothing. In other shops good workmen as well as poor might be debited on their weekly wages with the losses of an unprofitable year. While it must be conceded that an unprofitable year is the test of profit-sharing, it should also be conceded that the existence of losses is abnormal and contrary to the ideas on which all industry is founded. The laborer may be regarded as paying his share of losses through the depression in the market-price of labor, which always accompanies hard times, while capital does not always suffer from the same influence. An instance is known of a concern in which a large number of the workmen were small holders of stock. A bad season made it necessary to make an outlay of some $25,000 for improved machinery in order to meet competitors. There was only one way to provide for it, and this was by assessment of the stockholders. The small holders could not see that the investment of further money was for their benefit. Some of them raised the cry of robbery, and the result was that in order to save the business many of them were bought out. They would have made money if they had remained in, but there was no reasoning with them. The moment there was a bad showing for business the proprietors lost the sympathy of the men. They would not permit a reduction of wages, and even declared that they preferred to go back to the old method of employment, in which they had no share of the profits.

This brings us to what might be called the fatal defect in any systems of profit-sharing, so far as they have been tried down to the present time. It is very well for the employer to speak of considerable profits and his willingness to divide them among his men in some equitable way. Such a division is not only generous, but it is profitable to the employer in the end, because every man in his employ will have some incentive to work. The employer thus guarantees extra pay to the employed. But can any one guarantee to the employer that every year will be a profitable one? And if there are losses, who shall make them up? Shall the employers make them up by themselves; or shall the men, having once been taken into a partnership upon the profits, still continue that partnership by making up their share of the losses? There are many employed men who are the owners, or the partial owners, of their own homes. They would gladly enter into an arrangement for the division of the profits; but they would hesitate to mortgage their homes as security to their

employers for their proportion of the losses in a bad year. Other employees could offer no security whatever in such a case; therefore the losses must come upon the employers in the end. It is this fact that hurts the prospects of profit-sharing more than any other. Such an arrangement cannot be in the nature of a true partnership; because, as noted above, there is a partnership so far as the gains are concerned, but the partnership ceases when there are losses. Hence, as at present tried, the system of profit-sharing is really a gratuity on the part of the employers. This should not be so. The extreme grounds taken by the Knights of Labor and, to a lesser extent, by the trades-unions, have been due, for the most part, to a feeling among the employed that the employers were making large profits and that the men should have a share of them. Occasionally an employer has been willing to concede the truth of this, enough to give his men a share in the profits; but most of the employers have taken the ground that they must average their good years with their poor years in order to keep their men employed uniformly.

Hence there has been little gain, except in a few instances of profit-sharing, in bringing about a sympathy between the employers and their men. Without such sympathy it is impossible for capital and labor properly to understand each other, or to work in harmony. A careful study of the instances in which profit-sharing has been a success shows that those employers who have succeeded were those small employers a generation ago, before the advent of the great corporations. There could be no greater enemy to the cause of the workingmen than the prevailing idea of to-day, to combine every thing in the shape of trusts. Edward Bellamy and other writers carry more truth in their predictions than will be admitted by those who have made no study of the facts. Some day there may be a revulsion of feeling against such combinations that may lead to the more simple and direct methods of employment that were in vogue two generations ago when strikes were almost unknown. The present tendency toward trusts is wholly away from any form of profit-sharing; and this is one of the worst signs of the times. On the other hand, and the speaker has it from prominent members of labor organizations, the tendency among such organizations is toward profit-sharing as the only method that will be fair toward both the employer and the employed. But even if trusts were out of the way, can any one promise that employers shall always have good years; that in the event of a poor year the employed would make up the losses; or that any system of profit-sharing has yet been devised which may be called ab-

solutely perfect? These are questions which the speaker is not able to answer. He has only laid before you a number of very interesting cases where the experiment has been tried. He cannot attempt to make the present condition of things any different from what it is.

THE FIRST CONSTITUTION OF NEW YORK.

By S. N. D. North.

[Read before the Albany Institute Feb. 7, 1888.]

It is one hundred and eleven years since a body of men met in the Court House in the village of Kingston on the Hudson, and solemnly ratified the first Constitution of New York. Each member of that convention, as he signed his name and kissed the Bible in token of his fealty, knew that he was putting his signature to what might prove his death warrant. The first Constitution of New York was full of ugly treason to the king, and treason to the king was just then ticklish business. New York city and Long Island were in possession of the English forces; the royal governor no longer issued his orders from a British ship of war in the harbor; and Sir Henry Clinton's magnificent scheme for dividing the colony of New York into segments, by fighting his way up the Hudson to meet Burgoyne in his descent from Champlain, and St. Leger in his eastward sweep from Oswego, was already developed. Where men and means to checkmate this fatal plan were coming from, not one of those civilian patriots could tell. They had barely promulgated their Constitution, by the ordinance of April 22, 1777, and hurried George Clinton from the field to take the oath as their first free governor, before the enemy came down upon the legislature at Kingston and put it incontinently to flight.

Hidden under some member's coat, the Constitution was hurried through the woods to the back settlements. For a time it was doubtful if the State of New York would ever see the light of day again. To still profess loyalty to that Constitution seemed like laughing at fate. But it emerged from the woods to rank as the best model of a free commonwealth the world had yet seen. It survived the crisis out of which it was born to pass through the severest tests ever applied to the principle of local self-government. The pressure which one hundred years have crowded upon this Constitution in all its parts has forced into exact adjustment the autonomy of government it establishes. Under this strain the experiment those anxious men at Kingston put forth with fear and trembling, has ceased to be an experiment, has become

a science, each separate principle of which has had its cause and effect established in experience.

Circumstances have so shaped themselves that New York has done more than any other State, more perhaps than all other States, to test, to simplify, to re-adjust, to develop, to strengthen the autonomy of the American system. She is and has been from the first, the Empire State, largest in extent, most varied in topography and geological resources, wealthiest in her industries, most diverse in her pursuits, the most populous not only, but the most cosmopolitan in population, with a commerce that pays ninety per cent of the national revenues, with natural and artificial water-ways and railroad systems that bring tribute from every sister State, the very heart, geographically, commercially, industrially, politically, of our confederated nationality.

New York was the last of the thirteen colonies, as Massachusetts was the first, to formally put off the swaddling clothes of provisional government and pass under the voluntary restraint of a self-regulating, self-perpetuating popular sovereignty. In the interim, her Constitution has been amended more frequently and more radically than any other in the Union. In the interim she has tried every experiment in constitutional government that has found favor in this country; has rejected many of them after demonstrating their failure; has modified others; has deserted some not perfect for others less perfect. Each one of these changes has been to a degree a civil revolution. The frequency of their occurrence, the ease with which they have been effected, the absolute acquiescence in their supremacy each time manifested, combine to make a spectacle without parallel among the nations of the old world, and proving to us that our self-government is not mythical but absolute — a spectacle that proves the imperial sovereignty of the people obeying the law, but knowing neither written nor unwritten law that is beyond its reach — that is not "originated by its impulse, organized by its consent and conducted by its embodied will."

The recommendation to form State governments came from the general congress in 1775. The provisional congress of New York appointed a committee to draft a Constitution early in 1776. It was a year later before this committee reported. John Jay, its chairman, has written that the delay was compelled by the labors of its members in preparations for the defense of the colony. But the fact remains that two-thirds of the men of wealth and influence in New York had no sympathy with the movement for the organization of an independent State government, and either kept aloof from the struggle, or

sided with the king. In the colony at the outbreak of hostilities, they were the large landed proprietors, like Beverly Robinson, Frederic Phillipse, Philip Van Cortlandt, David Colden, Sir John Johnson, of Tryon county, and they controlled the political opinions of their tenantry. Among the adherents of the crown were some of the Livingstons, Staats Morris, the brother of Gouverneur Morris, and Dr. Isaac Wilkins, his brother-in-law, whose influence in the colonial assembly kept that body to its kingly allegiance after hostilities had actually begun.

These differences were made more potent by the jealousies which New York already felt toward her sister colonies. Already her citizens foresaw that New York was to be the Empire State. They were aware of the commercial supremacy of her harbor; they knew there was no limit yet set to the spread of her settlers through the wilderness of Tryon county — then the "great west;" and they detected little profit in alliance with weaker States. During the entire year that this committee waited, it was doubtful whether New York would be one of the confederacy, or the ally of the king against her neighbors. The influence of a few bold and far-seeing men barely turned the scale.

These things make it all the more a matter of marvel that the first Constitution of New York, when finally adopted, was a frame-work so free from faults. It is the verdict of experience, that it was the best of the thirteen Constitutions under which the colonies severally passed upon the Declaration of Independence. Bancroft says of it, that although it was the last of the thirteen, "in the largeness of its humane liberality, it excelled them all." The praise of the eminent historian brings us face to face with its chief beauty. Seven of the thirteen States required some religious test, as a qualification for office. In Massachusetts and Maryland, it was enough to declare "belief in the Christian religion." In South Carolina and Georgia it was "the Protestant religion." In North Carolina, it was "God, the Protestant religion, and the Divine authority of the old and new Testaments." Not until 1877 did New Hampshire formally remove the test of Protestantism from her organic law. New York, one hundred years ago, alone of all the States, abolished all religious tests for office; and in the name of "her good people," she did "ordain, determine and declare the free exercise of religious profession and worship, without discrimination or preference, to all mankind." The men of this young commonwealth felt themselves "required by the benevolent principles of national liberty, not only to expel civil tyranny, but also to guard against that spiritual oppression and intolerance

wherewith the bigotry and ambition of weak and wicked princes have scourged mankind."

Here was the beginning of that absolute toleration in religious belief, and the complete separation of church and State, in the United States. New York was so far in advance of her sister States because there was so much of the spirit of Holland in her early institutions, and because no one of the classes that had chosen a particular way in which to worship God was in political or social ascendancy within her borders. With the Dutch Protestants were mingled the English Puritans and the French Huguenots in nearly equal proportions. Upon this body, were grafted segments of German, Swedish, Scottish and Irish, besides Catholics, Quakers and Churchmen from England. It is said that eighteen languages were spoken in the thriving village of New Amsterdam, when Stuyvesant surrendered the fortress to the English. All these diverse elements found a neutral ground in the principle of toleration. They were all more or less directly represented in the convention from which emanated the Constitution of 1777.

That convention was composed of men in every sense representative. They had had large experience in public affairs, in the colonial assemblies, or the continental congress, or the corporation meetings. A committee of thirteen was appointed to draft the Constitution. Of these John Jay, Robert R. Livingston, Gouverneur Morris and James Duane were the men who left their individual impress upon the instrument. Upon Mr. Jay devolved the principal labor of its preparation, and to him belongs its chief honor. The original drafts, still preserved in the State Library at Albany, are almost entirely in Mr. Jay's handwriting.

In the distinctive features of the Constitution of 1777, we can trace unerringly the political convictions of its framers. Mr. Jay and the associates I have named were born in New York, all graduates of King's college, all bred lawyers, and at the close of the war all espoused the Federalist side of national politics. They had learned, by bitter experience, to distrust a supreme authority; but they were not Democrats, either by habit of mind, or by education and association. Judge Hammond says that originally New York was the least democratic of the colonies, and all the facts sustain his judgment. The early political principles of the colony somewhat resembled those of a feudal aristocracy. There was no written charter, as in Rhode Island and Connecticut, where for years before the revolution there existed a pure democracy. The difference between the colonies in this

respect is illustrated by the fact that these two New England States were content to live, one of them until 1818, and the other until 1842, under charters granted by Charles the Second in 1662, while New York has constantly amended and completely changed the Constitution she originally adopted as the best.

Jay and his associates had no training or experience which inculcated confidence in the masses. They sought to invent an equipoise, as nearly perfect as ingenuity could devise, between their fear of a supreme authority and their distrust of the people. It has been popular since to denounce them for their timidity. But the time has not yet come when it is safe to say that their Constitution was not at least as good as the one their successors have put in its place. The idea of universal suffrage seems not to have occurred to this committee or to the convention which ratified its work. The suffrage was not a natural right but a political privilege, in their plan. They limited it to the freeholders, and carefully adjusted it to a sliding scale of property. Thus the possessor of a freehold of the value of twenty pounds, or the tenant paying a yearly rental of forty shillings, could vote for a member of assembly; but they must be "possessed of a freehold of the value of one hundred pounds above all debts charged thereon," to vote for a senator and the governor and lieutenant governor. The voters in the latter class were as one to seven of the citizens now entitled to the franchise — a most undemocratic proportion. The pride of land was strong, and the freeholders alone were thought capable of using the suffrage otherwise than to the prejudice of property. The senate was especially devised to stand guardian over the landed interest. Only freeholders were eligible to it, and it was a perpetual body, in the sense that the United States senate is such a body. Its model was plainly the English house of lords. The lower house, like the English commons, was devised as the guardian of life and liberty. The members of the assembly were not required to be freeholders, and so it happened that a citizen might be elected to the popular branch of the legislature who was denied the right of suffrage.

These minute distinctions were clumsy and perhaps absurd, but there was never a disposition in New York to nurse a hereditary aristocracy. Virginia alone enforced a system of entails by constitutional enactments, and in this solitary state, under the lead of Jefferson, the provision for perpetuating hereditary aristocracy was abolished by the first legislature that sat under the Constitution. From the example of the Dutch patroons, New York had become a colony in which the

great families managed the public affairs almost exclusively. On Manhattan Island there was an aristocracy of culture which shared the honors of the aristocracy of land, whose manors included nearly the entire counties of Albany, Rensselaer, Columbia, Green, Ulster, Westchester, Orange and Tryon — about all the interior then settled. But it was only two years after the adoption of the Constitution of 1777 that a law was passed for the gradual abolition of all feudal tenures. The proprietors of the great manor grants, unwilling to yield their feudal privileges to public sentiment, contrived forms of deeds by which the grantees covenanted to perform services and pay rents similar to the feudal incidents which had been abolished. Hence sprang the anti-rent troubles, and twenty years of blood and disorder throughout the State. These are not chargeable to the framers of the Constitution, who simply acted on John Jay's doctrine, that "those who own the country ought to govern it."

Another singular proof of the undemocratic instincts of these first statesmen of New York is the timidity with which they ventured upon the innovation of the secret ballot. They acknowledged the existence of a widespread belief that "voting at elections by ballot would tend more to preserve the liberty and equal freedom of the people, than voting *viva voce*," and, therefore, provided for a temporary test of the ballot system, "to the end that a fair experiment be made which of the two methods of voting is to be preferred." Indeed, the conservatism of these men in every direction, shows that the present widely misjudges the spirit of the age for which they acted. They ventured upon no wider departures than were rendered necessary by their enforced rejection of the supreme authority of the king and the parliament. There is not in the whole instrument a trace of speculative theory, or of metaphysical distinction, or of platonic tendency. They labored to invent no new popular rights. They sought only to secure to the colony the rights of which it already deemed itself possessed. They were not the inventors of a new system of government — they were the conservators of an old system. They accepted the trial by jury, the writ for personal liberty, the practice of representative government, the limited suffrage, the separation of the three co-ordinate branches of government, the independent tenure of the judiciary — just as they inherited them. They went further, and accepted the common law of England, the statute law of England, and the acts of the colonial assembly, as the law of the new State, "except in so far as repugnant to the government established by this Constitution." They even preserved the customs of government they had grown into

from long imitation of England. For many years after New York became an independent State, the governor, in imitation of the king and his colonial predecessor, addressed the legislature at its opening in person, and the legislature, like the English parliament and the colonial assembly, immediately responded in a message expressive of its high consideration and its views upon the executive recommendations. The convention of 1821 prescribed the written message of to-day, on the ground that the English plan brought the legislature and the executive so closely together as to be unrepublican.

Every innovation of the Constitution of 1777 hinged upon the one radical and necessary innovation of a governor deriving his authority directly from the people, instead of from the king, and responsible directly to them for its exercise. Long suffering because of the arbitrary exercise of authority by royal governors had made all the colonies supremely jealous of the one man power. In New York they had convened and prorogued the colonial assembly at will; had constantly and grossly abused their absolute veto upon all acts passed by that body; and in the long series of collisions which preceded the Revolution had thus done much to hasten the crisis. Jay showed his conscientious adherence to precedent by preserving both these functions to the governor, at the same time creating rigid safeguards intended to prevent their abuse. Most of the colonies deprived the elective governor of all power in assembling and dismissing the legislature, and instead of the veto gave him simply a casting vote in lawmaking. But the New York governor was empowered to convene the legislature "on extraordinary occasions," and to prorogue for sixty days — an authority never but once exercised.

But New York had seen a royal assembly filled with sycophants, elected as recently as 1768; and, therefore, distrusting popular assemblies quite as much as the one man power, they devised a series of novel expedients for making one a check upon the other. They not only inaugurated John Adams' plan of two legislative bodies, but devised a council, a sort of third and final legislative chamber, suggested no doubt by the English privy council. To this body — the apex of the pyramid — they intrusted the power of veto. This "council of revision" was the chief evidence of the reluctance with which these statesmen surrendered inherited institutions. Its defect lay in the fact that it smothered individual responsibility, by making the governor but one of four men upon whom responsibility fell equally. His associates in the veto were the chancellor and two judges of the Supreme Court. Reliance upon the judges was natural and safe, but

it was a sign of the crude state of the science of self-government, for it merged the judicial and legislative departments of government into one. No evil ever resulted from the anomaly; but it was an anomaly none the less, and as such it was deplored by the next generation of statesmen, and by the judges most of all. In 1821 the demand for a revision of the Constitution called into existence a popular convention for that purpose. Its first act was to abolish the council of revision by a unanimous vote. The advantage of reposing the veto power in the governor, empowering two-thirds of the legislature to over-ride it, has never since been questioned.

An even more striking evidence of this joint distrust of a supreme governor and a supreme people, was the method devised in this Constitution for the appointment of the minor officers of government. The people were intrusted only with the election of governor and legislature—all the other officers, high and low, were either selected by the legislature or by a "council of appointment," consisting of the governor and four State senators, selected for that purpose by the assembly. This council was a device unique in the New York Constitution. The result of the patient study of disinterested statesmen, intent only upon insuring administrative purity, it nevertheless proved a pitfall, deep and wide and dirty. It was complete centralization, without that personal responsibility which can alone prevent the abuse of great power, and in attaining which the present Constitution of New York achieves its chief superiority over that of 1777. The officers whose appointment was thus centralized were the sheriffs, county clerks, justices of the peace, mayors of cities, and all the officers of the militia. Two thousand of these local officers were thus commissioned when the machinery of the State government was set in motion. By 1821, the number of these officers had increased to eight thousand military, and nearly seven thousand civil officers. It was a vast patronage, centralizing at the State capital the control of the appointment and tenure of officers whose functions concerned the people hundreds of miles away and concerned no one else. So soon as the clouds of war rolled by, and the people settled down to peaceful vocations, the council of appointment became the objective point of faction and intrigue. The politicians began a fierce struggle for the control of this patronage. Early in his illustrious administration of eighteen years, George Clinton was confronted with the doctrine that each member of this council had a right, co-ordinate with that of the governor, in originating nominations. In vain he protested against the encroachment. When John Jay vacated the office of chief justice, to succeed

Clinton as governor, he had opportunity to ponder the pernicious workings of his own device. All the offices in the State were then filled with men of Clinton's political bias, and it was not long before a Democratic council was appointed to co-operate with Jay. Thereupon, his nominations were one after another rejected, and the council finally refused even to vote upon the names suggested by the Federalist governor, and proceeded to fill the offices with men of their own party. The governor, rather than submit to the obvious infraction of the spirit of the Constitution, summarily adjourned the council, and to the end of his term the civil commissions in eleven counties were unrenewed. Upon his suggestion a popular convention was called to settle the dispute. It fell under the control of the Democrats, and it became a point of honor with them to stand by the action of the Democratic council. Accordingly the convention declared that the power of originating nominations was vested equally in the governor and each of the councillors. Thereafter the governor became a respectable cypher. The four senators annually selected for councillors were the tools and agents of popular leaders. No qualification was required of them but subserviency. The control of the council became the goal of contending factions. With every fluctuation of politics, there was a revolution in the offices all over the State. It frequently happened that some petty office had three incumbents in a single year. DeWitt Clinton was a member of the council which raised this issue against Governor Jay. When Clinton himself became governor he frequently had the mortification of seeing his friends swept out of office in brigades, and of signing the commissions of his inveterate enemies.

To this feature of the first Constitution of New York, history must attribute the fact that under that Constitution the political annals of New York State comprise little else than the wrangles of innumerable factions — wrangles which thrust men before measures, involved no principles, and exceeded in bitterness anything known elsewhere in the nation. From his New York training, Van Buren imbibed the doctrine that to the victors belong the spoils. It had flourished in the Empire State a quarter of a century before its taint spread to the national administration. DeWitt Clinton was the first man to formally announce that the offices ought to be distributed as rewards to persons in sympathy with the party in power. But before his day the council of revision had been used by the powerful families of Clinton and Livingston to crush out, first the Federalists, and then the following of Aaron Burr. Finally the Clintons overthrew the

Livingstons, with the same weapon of attack. The personal character of New York politics thus grew to be a mystery abroad and a scandal at home. The convention of 1821 was chiefly demanded to abolish the council of appointment. Thereafter the scandal grew less and the mystery disappeared.

Such were the features of the Constitution of 1777 which the people have outgrown and pushed aside. From the date of the convention of 1821, a political spirit and philosophy, widely different from that of Jay and his associates have brought their influence to bear upon the document. Little by little, every thing but the bare skeleton of the government they framed has disappeared. Two tendencies have marked the principal changes — the tendency to concentrate executive responsibility for administration, and the tendency to relegate more and more to the people the control of their own local affairs. The governor of 1777 was a pigmy in power, beside the governor of to-day; and the people were many removes farther from the direct control of their government.

These tendencies mark the rapid development of the Democratic idea. Their natural accompaniment has been the broadening of the basis of suffrage until every barrier which Jay and his fellow Federalists erected for the protection of property has been ruthlessly battered down. The convention of 1821 was the first battering ram. The great struggle in that body was upon the proposition to abolish the property qualification for senators, and to enlarge the basis of suffrage. The power of the landed interest had been steadily decreasing since the Revolution. The old Federalist party, with its chronic distrust of the masses, had well nigh melted out of existence. A few distant counties returned delegates of that obsolete faith. They made a determined effort, under the brilliant lead of Chancellor Kent and Judge Spencer, to preserve the broad distinction between the senate and the popular branch of the legislature in the doomed Constitution. Judge Spencer quoted two such antipodes as Hamilton and Jefferson, to support the theory that stable government depended upon "a dissimilarity in the genius of the two bodies." The venerable Chancellor Kent accused the convention of bowing before the idol of universal suffrage. "That extreme Democratic doctrine," he said, "has been regarded with terror by the wise men of every age, because in every republic where it has been tried, it has terminated disastrously." "I greatly fear," he added, "that our posterity will have reason to deplore in sackcloth and ashes the delusion of the day." In a spirit of warning prophecy, the Chan-

cellor described the rapid growth of New York city, dwelt upon the ignorance, vice and pauperism which flourish in great cities, and predicted that in less than a century, with universal suffrage and under skillful management, the metropolis would govern the State. The convention paid no heed to his warning. It put all departments of the government on the same footing with respect to the suffrage, and practically abolished all property qualification.

Within less than the Chancellor's one hundred years, his prophecy has come true. The naturalized vote of the metropolis controls the voice of the State. Universal suffrage made the Tammany ring possible. Under the Constitution of 1777, Tweed would have been ineligible to the State senate. Under the Constitutions of 1821 and 1846, he was re-elected to that body after the exposure of his crimes. The philosophy of the report of the municipal commission appointed by Governor Tilden is, that the evils of which the tax-payers of New York complain are born of universal suffrage. The logic of this conclusion is its recommendation of a constitutional amendment restricting the suffrage in the election of municipal officers of finance to the tax and rent-payers. Thus after a century of departure, New York longs for a return to the methods of the fathers. In the memorable speech from which we have quoted, Kent declared that "however mischievous the precedent may be, however fatal in its effects, universal suffrage can never be checked or recalled, save by the bayonet."

The convention of 1821 did not misrepresent the people of that era. The freeholders subsequently ratified the changes proposed in the Constitution, thus voluntarily resigning the exclusive control of the government they had enjoyed from its inception. Just then they were inflated with the success of their experiment of self-government, and filled with unbounded confidence in the elasticity of the principle upon which it was founded. But they left one blot upon the sincerity of their democracy, which grows blacker with time. The convention which abolished all freehold qualifications for white men, decreed that colored men should have no vote, unless possessed of $250 property qualification. The distinction proves that the furor for universal suffrage was the furor of the politician, learned in the arts of popularity, not that of the philosopher-statesman, bent upon breaking down all distinctions of law in human society. The Constitution of 1777 was tolerant of all races as well as of all religions. But New York waited for an amendment of the Federal Constitution to sweep away a distinction of race which the founders of the State would have scorned to make.

Mo. Bot. Garden.

In 1846, another constitutional convention overhauled as much of the original Constitution as the convention of 1821 had left untouched. The tendencies of 1821 were still dominant, and had reached their extreme. The passion for permitting the people to pass directly upon every man in the service of the government extended to the judiciary. For the life-tenures, which had made the bench of New York the most illustrious in the United States, short terms were substituted, and every judge was compelled to become a politician, for thenceforth he must control a majority of the votes to reach the bench. A fourth constitutional convention, in 1867, indicated the development of a re-action. Its amendment to the judiciary article making the term of the elective judges fourteen years, was the only remnant of its generally excellent work, which survived the ordeal of the suffrage. With the judiciary as thus constituted, there is nothing thus far in results, which warrants any apprehension.

A provision of the amended Constitution of 1847, requires the legislature once in every twenty years to submit to the people the question, Shall there be a constitutional convention called? By the popular vote in the fall of 1886, another convention was ordered by an overwhelming majority. Disagreement between the legislature and the governor has thus far prevented the election and assembling of that body. It is impossible to account for the popular judgment that demands such a convention at this time, without apparent thought or realization of the significance or the risk it involves, and with no tangible or intelligent conception of any reform or advantage that can result from it. The work of the constitutional commission of 1874 resulted in the embodiment in the Constitution of every important modification of the organic law which has found approval in the experience of other States, or was suggested by demonstrated defects in the document as it then stood. If there are any specific changes required in the Constitution, which are at all likely to meet with popular acceptance at the polls, they are within reach through the safer, more conservative and more rational method of separate amendment, through the legislature, to be followed by the test of popular acceptance at the polls. The advocates of a convention have been challenged to name a single such change. They have failed to meet the challenge.

Why should we disturb the sacredness with which, naturally and rightly, the people of the commonwealth come to inshrine their organic law, by lifting it from its pedestal, and throwing it into an arena of politicians and pseudo-statesmen, to be pulled and hauled,

and picked and pounded, tinkered by experimentalists, denounced by professional agitators, degraded by cranks, and thrown back at us, a soiled and trampled thing?

I am not claiming that our present Constitution is a perfect instrument; I am protesting against a vicious method of modification, and I am also insisting that, remembering its history and recalling the gauntlets it has run in the century of its existence, we are justified in congratulating ourselves that it is as good as it is. Like a piece of genuine metal, it has been hammered by many hands into every shape; but it is the genuine metal still, with texture and fiber still perfect. It is the same Constitution, just as a man is the same man, after the growth of years has changed every particle in his physical organism. It has not withered under the touch of the demogogue or the breath of popular clamor, or the poison of official corruption, or the strain of political intrigue. It has been the shield of bad men, the cloak of bad schemes; but it is still the safeguard of the greatest commonwealth in the Union. The statesmen who pondered long over its first draft, would be amazed and panic-stricken, if they could now behold the work of their hands. The things they sought most earnestly to avoid, are securely imbedded in the organic law. But with these things have come other changes, and the greatest security of New York's present Constitution is one they forgot to ensure to their descendants — the perpetual provision for the education of the masses at the expense of the State.

THE WEST INDIA COMPANY AND THE WALLOONS.

By Ernest J. Miller.

[Read before the Albany Institute, March 20, 1888.]

In the discussion of this subject it makes but little difference whether this great river of the North as it was called, was first discovered by a Florentine captain in a French vessel, or by an English captain in a Dutch vessel; it will answer our purpose to start with the fact that the Dutch vessel under its English captain sailed up this river in 1609 as far as where this city stands; and the territory being claimed by the Dutch, they held it against all other claimants as long as it was possible for them to do so. Their great power at this time was the West India Company, and if we would rightly understand this early history we must know something of the formation of that company, its purposes and designs.

The West India Company was a monstrous monopoly. We are accustomed to think that the present day shows us the most powerful and grasping corporations the world has ever seen, and as our present organizations add one source of traffic or travel after another, to the great and vital interests they already control, we are possessed by a feeling somewhat akin to fear, as we wonder what the outcome of such gigantic schemes will be. But in absolute governing power over territory, as well as executive power over the individual, this corporation of the seventeenth century would put to blush any thing the nineteenth century has ever seen. It may even be doubted whether more capital was employed, if we take into consideration the difference in money value of two centuries ago; while the powers given under the franchise were far greater than could be obtained now from any Legislature, no matter how venal, or from any executive no matter how corrupt. And first we notice that the charter of this company was granted by the States General, and that its privileges were to enure to the benefit of those who subscribed to its stock. It was formed just as a bank or insurance company was formed before the passage of the general law applicable to such corporations; the charter was obtained from the legislative power, and then the books were opened for subscriptions to the stock. When the subscription books were closed on the 21st of

June, 1623, the corporation of the West India Company was possessed of a monopoly of trade and commerce that seems almost past belief. For the States General of the United Netherlands had by this charter specially enacted "that for the term of four and twenty years none of the natives or inhabitants of these countries (that is, the United Netherlands) shall be permitted to sail to or from the said lands (that is, the West Indies and Africa and places hereafter prescribed) or to traffic on the coast of Africa from the Tropic of Cancer to the Cape of Good Hope, nor in the countries of America or the West Indies, beginning at the fourth end of Terra Neva, by the Straits of Magellan, La Maire, or any other straits and passages situated thereabouts to the Strait of Anian, as well on the North sea as the South sea, nor on any islands situated on the one side or the other or between both; nor in the western or southern countries reaching, lying and between both the meridians, from the Cape of Good Hope in the east, to the east end of New Guinea in the west inclusive, but in the name of this United Company of these United Netherlands."*

And if the provisions of this charter were violated by any of the people of the New Netherlands — if any of the inhabitants presumed to enter into trade with any of these countries without the consent of this company — their ships and their goods were forfeited and became the property of the company upon being actually seized by them; and if taken to other countries and sold by their owners, the company was permitted to fine the owners an amount equal to the value of the ship and the goods. These certainly were extraordinary privileges, and extraordinary powers were needed to make them effectual; it would have been but of small avail, to invest a company with the control of the trade of half the world, and withhold from them the authority to carry out their stupendous schemes. And these powers were granted as lavishly as the privileges had been bestowed. They granted them executive, legislative, judicial, military and naval powers, besides promising to defend them against every person who might seek to engage in trade and traffic; and agreeing to assist them with a million of guilders in five years. They gave them the power to make treaties with the princes and natives of the countries before mentioned; to make alliances both offensive and defensive; to build forts, for the garrisoning of which the States General were to furnish troops who were to swear to obey the commands of the company; to appoint and discharge governors and officers of justice and other public officers; and to seek to colonize all the countries over which the charter extended,

*O'Callaghan's History, vol. I, appendix A, page 399.

which colonies were to be under the control of the company. If any of the natives cheated the company under the guise of friendship, or if the company suffered the loss of their money or their goods without receiving restitution or payment for them; or if the company were badly treated — the charter not specifying what acts should constitute bad treatment, and leaving the company to be the sole judges of the fact, whether or not they were badly treated — then and in all these cases, the company were permitted to use the best methods in their power to obtain satisfaction, according to the situation of their affairs; a privilege as vague in its definitions as the causes which might occasion its exercise, and making the company the sole arbiters of the lives and property of all the people over whom its authority might extend. They could not be deprived without their consent of any ships, ordnance or ammunition even if the same were needed for the use of the mother country, and at the same time were allowed to pass freely with their ships and goods without paying any toll to the United Provinces. And all this tremendous power, although vested in five chambers of managers in different cities of the Netherlands, was in reality vested in nineteen men by whom all the business was managed and finally settled; the only reservation being, that in case of resolving upon a war, the approbation of the States General should first be sought. And as if the committing all these affairs to nineteen men would not make the company a sufficiently close corporation, it was also provided that no one during the existence of the charter, could withdraw his capital, nor could any new member be admitted; thus preventing not only the sale but the transfer of the stock, and so effectually closing the door against the financial sports of the present day, the merry bull fights and the joyous bear baitings. And so the company begins its operation under the following preamble: That the States General had seen fit to form the corporation because the prosperity of the countries over which it should rule and the welfare of their inhabitants depended largely on navigation and trade which had been carried on happily in former times, and had proved a great blessing to all countries and kingdoms; and further that the trade might be increased in conformity to the treaties and covenants under which they should enter; and that experience had shown them that without the assistance, interposition and help of a general company, the people who desired to go to these foreign lands could not be properly protected and maintained in their great risk from pirates, extortion and otherwise, which would happen in so very long a voyage.

The beneficent nature of this preamble, when compared with the

sovereign power given by the different sections of the charter, may well lead us to believe that trade and commerce were not the sole objects in view in the formation of the company; and this belief is strengthened by one of the sections of the charter, which provides for a strong and well-armed fleet of vessels — partly furnished by the States General and partly furnished by the company — which would be very much more than adequate for the simple protection of commerce and trade; and by another section, which enacts the disposition to be made of prizes taken from enemies and pirates, which were to be under the control of the managers of the company, and of which the account was to be kept separate and apart from the account of trade and commerce. It is very true that the section was ordained to apply only in case of a war; but if war was likely to follow, or rather if peace should be delayed because of the formation of the company, then it must be conceded that the States General had put themselves on a first-class war footing, and were in position to reap all the benefits that could be derived from an armed naval force patrolling the seas.

And that was just exactly one of the objects in forming the company, if not the sole object; at least all others were incidental and subject to this. And Spain, the old enemy of the Netherlands, was the country to be made to suffer, and the riches she carried in her vessels were to be forcibly seized and appropriated; for their long study of the weak points of the Spanish empire had taught the Dutch that on the seas, they were more than her equal, and that by destroying her commerce they might compel her to submit to their conditions of peace. The scheme to form such a company, was first broached to the States General in 1592, by William Usselinx, a native of Belgium and a merchant of Antwerp, who was compelled by religious troubles, for which Spain was responsible, to leave his native country and seek refuge in Holland. His hatred of Spain was most intense; he never seems to forget how much he had to suffer through her; and in all his writings in the furtherance of this scheme, he is continually pressing the point of the great importance to Holland of the West India commerce, and that if peace negotiations were entered into with Spain, the States General must by all means preserve their freedom of trading to America.

But it was more than twenty-five years before this scheme could be consummated. Holland had plans of union to effect, and the proposition met with most determined opposers. Alva had been defeated; and after the negotiations with Philip had dragged along to no purpose, Holland and Zealand drew up articles of union and an ordinance for their joint government, under William, Prince of Orange. But with-

out going into the historical particulars which finally led to the formation of the Dutch republic, it is sufficient to say that the union brought about by the prince's personal popularity, and the people's trust in him was distasteful to the larger cities; and even at this early day foreshadowed that division which afterwards became so prominent in the Netherlands — the land party against the sea party — the Calvinist against the Arminian — the popular against the civic and aristocratic. But William of Orange came to his death by the hand of the assassin, and the work he had begun was therefore transferred to his second son Maurice. He had all the characteristics of the family of Nassau; he was cool, calculating, ambitious, firm and self-possessed; and in addition to these qualities he was endowed with a military genius that gave him the rank of the greatest captain of the age. For this position he was chiefly indebted to that wise statesman and pure patriot John of Barneveldt; and the terrible stain upon his record, is his ordering the execution of this wise and pure-minded man. Under the leadership of Maurice, the war on land was prosecuted with varying success — but the war at sea was carried on with great vigor; and the sea fight at Gibraltar in 1607 ruined the Spanish fleet, and left her great commerce at the mercy of her assailants. Then ensued negotiations for peace; and the party lines became more distinctly drawn; Grotius and Barneveldt representing the patriot party, while against them were opposed the official classes, the army, the navy, the East India Company, the clergy and the populace. But the patriotic peace party prevailed, and a truce with Spain for twelve years was signed. It was during the negotiation for this truce that the project of forming the West India Company was presented to the States General. It met with a stern opposer in Barneveldt. He argued, that to form a company for the avowed purpose of preying on Spanish commerce, would necessarily tend to prolong the war; and so powerful was his influence and so potent his arguments that as long as he lived he was able to prevent the consummation of his plan.

It will take us but a moment to sketch in a brief manner the circumstances that led to the execution of this great man. The part he took in bringing about the truce with Spain had made Maurice his determined enemy, and the two men became leaders in a struggle that was partly political and partly theological. There had been two professors of theology appointed in the university at Leyden — Jacob Van Harmansen, called by the Latin name of Arminius — and Francis Gomar. Arminius assailed, and Gomarus defended the current popular theology. The views of Arminius spread among the upper classes in the

larger towns, and became the theology of the civic aristocracy; the opinions of Gomarus were tenaciously supported by most of the clergy, the peasantry, the army and navy. Barneveldt stood at the head of the Arminian party, contending that each province should be free to adopt the form which it preferred; Maurice as the chief of the other party, was determined to have the Gomarian views established as the state religion, and that no other system should be tolerated. This state of affairs causing disturbance, Maurice assumed supreme power, and all attempts at reconciliation between him and Barneveldt were of no avail. Barneveldt was arrested and imprisoned, and shortly after the assembling of the famous Synod of Dort, his trial began before a special commission. He was found guilty and sentenced to death, although the proceedings against him were illegal and the charges against him were disproved. The synod decided the theological controversy in favor of Maurice, which enabled the prince, for his own political purposes, to crush the autocratic party in the person of its head; and five days after the closing of the synod this venerable statesman and incorruptible patriot was beheaded at The Hague. The death of Barneveldt was the removal of the greatest source of opposition to the formation of the West India Company, and in a year or two thereafter its charter was granted.

I have said that the chief object of the West India Company was to prey upon the Spanish treasure at sea, and to cripple the commerce of Spain; and this I believe to be the opinion of the later historians who have carefully examined the history of the times by the light of the more recent documentary discoveries.

In his work on the history, or yearly account, of the proceedings of the West India Company, Johannes de Laet frankly admits that the object of the company was war on Spain; and he congratulates the country on the success they have obtained. De Laet was in the best possible position to know the truth of his statement; for he was a director of the West India Company, and also a co-patroon of Rensselaerwyck; while his acknowledged painstaking and carefulness as a historian would prevent him from making an unwarrantable statement.* And the war as it was prosecuted was a successful one for the company. Wealth poured into its treasury; and in one single year the directors were enabled to declare dividends to the amount of fifty per cent. One of the Dutch captains came across the Spanish silver fleet and succeeded in capturing nineteen of the vessels, and brought all but two of them to Holland. The spoil was simply immense; for there was

*"Narrative and Critical History of America," vol. IV, p. 418.

on board nearly one hundred and forty thousand pounds of pure silver, valued at 12,000,000 guilders.* This was a result that Barneveldt feared would happen if the company was chartered; the desire for large gains would be added to the success of conquest, and war would be prolonged for mercenary purposes and national renown; and the arts of peace that tend to build up a nation on a firmer basis, would be cast aside for the more dazzling glories of war. Yet the course they pursued was not an unusual one, nor one deserving of great blame. Spain had been for years the most malignant, cruel, blood-thirsty enemy that Holland or any other country on the face of the earth ever had. Murder, fire, persecution and the sword were her allies in war; deception, intrigue and broken promises were her companions in peace; and if ever a nation of noble, fearless, God-serving patriots were driven to destruction and frenzy by cruelty and crime, the Dutch were that nation; and if the means they took to avenge themselves were not perfectly justifiable in view of the proposed truce, let the rivers of blood Alva's persecution poured forth, be their excuse; and let the nation who under their sufferings would have done differently, cast the first stone.

But were we disposed to criticize with severity the purposes for which the West India Company was formed, and the manner in which these purposes were carried on, we must admit that in its system of colonization it was governed by the principles which are more in accord with the known characteristics of the Dutch people. Their colonies were not oppressed or ground down or subjected to onerous burdens; those who were sent as rulers were generally men of ability, fairness and honesty; the sentiments of religious freedom and unrestricted commerce were fostered in the minds of the colonists; and the principles of self-government were clearly seen written over the rules for the guidance of their colonies; and although the company was not successful as the developer of a new country, for the simple reason that it was organized for warlike, rather than for fostering, protecting, colonizing purposes, still it left a beneficial impress on this State, and the work it has done here can never be effaced, although the policy under which it acted worked its own ruin.

But we have at this time more particularly under consideration the work the West India Company did as the colonizer of this State, and also the applications made to them for the privilege of settling here under their protection; and why the privilege was granted to some and denied to others, is an interesting part of our early history.

The massacre of St. Bartholomew caused large numbers of the in-

* Broadhead's History of New York, vol. I, p. 184.

habitants of the Walloon country to emigrate to England and Holland. The Walloon country was at that time the Southern Belgic provinces of Hainault, Namur, Luxemburg, Limburg and part of the ancient Bishopric of Liege, and is now comprised by the French department du Nord and the southwestern provinces of Belgium. The people spoke the old French language and they were called in that tongue Gallois, which was changed in Low Dutch into Waalsche and in English into Walloon.*

When the northern provinces of the Netherlands formed the union at Utrecht in 1579, to which I have before referred, the southern provinces refused to join them, preferring a reconciliation with Spain and the enjoyment of the Catholic religion, to which they were greatly attached. Against the Walloons, professing the Protestant faith, the Spanish government instituted a most rigorous persecution and multitudes of them fled to Holland. There they were received with open arms, and admitted to all rights, civil, political, and religious; and Walloon colonies and Walloon churches were formed in all the principal cities of Holland.

Although they adhered to their own language, they acquired the Dutch language as well, and retained their national characteristics for several generations, although allied by marriage to many of the principal Dutch families. There was no city of Holland that drew to itself more of the persecuted among this people and the Huguenots of France, than the city of Leyden; and they had grown to be quite a colony when they saw a company of English refugees arrive in the city. They were plain English farmers who could speak neither the French nor the Dutch language, and had nothing in common with the Huguenot or Walloon, excepting the controlling desire for freedom in religious matters. For these Englishmen were a peculiar people —honest in purpose, virtuous in life, but at the same time so tenacious in their personal opinions that they could scarcely agree with each other, much less with any one not of their peculiar views. Their path in life was not only narrow, but it was walled up on each side; so that they were restrained from fraternizing with any one who did not walk right beside them or exactly in their footsteps. They never comprehended the full scope and import of the motto of the great reformer, "in essentials unity, in non-essentials liberty, in all things charity;" but they laid down a law for living, without an equity side to it, and inflicted penalties for its enforcement with a justice that was never tempered by mercy.

---

* Dr. DeWitt's paper before the N. Y. His. Soc. Proceedings 1848, p. 73.

It is not to be wondered at therefore, that the Puritan felt less at home than any of the other religious refugees that found an asylum in Holland, and that his thoughts early turned to America as the place where his religious views could be fully carried out without interference or objection; since there he would be the maker and the executor of the laws. And the circumstances that determined his final choice as well as the choice of the Walloons are well worthy of consideration.

The Puritan, shortly after the settlement at Jamestown had been fairly established, had carefully considered the practicability of making his home in some portion of the territory granted by King James I to the two Virginia Companies, the London and Plymouth. But there were difficulties in the way; if they settled in the English colony at Jamestown they feared they would be subjected to the same persecutions that had been their lot in England; and if they settled too far away from the English colony, they would not be able to receive the aid and protection they needed from the colony. After much weighing of the question, they finally decided boldly to ask the London Company for permission to settle in some uninhabited portion of their territory, preferring the wild beast and wilder Indian of the wilderness to the bigotry, as they considered it, of the settlement. To obtain this necessary consent of the Virginia Company, John Carver and Thomas Cushman were sent to London; and for fear that their application would bring to mind their peculiar history, and so arouse opposition, a declaration was prepared, signed by the pastor and elder, wherein they gave their full assent to all the doctrines of the Church of England, and their acknowledgment of the king's supremacy and the obedience due to him; their recognition of the lawful relation of church and state, and their disavowal of any authority inherent in any assembly of ecclesiastical officers, except as the same was conferred by the civil magistrate.

The Virginia Company were well disposed toward the Puritan commissioners; and they on their return made so favorable a report of their mission, that Carver and another were sent over to negotiate still further with the king and the company. But the business lagged and could not be brought to a successful termination; and their independent views led to a suspicion in the minds of the court, that they intended to make a free popular State, and the king was unwilling to countenance the scheme; so that the delegates on their return were forced to advise that the patent be taken on the evident assurance of the king, "that he would connive at them and not molest them pro-

vided they carried themselves peaceably." It seemed wisest to proceed on these terms; so in the spring of 1619, Brewster and Cushman were appointed commissioners to procure the patent from the Virginia Company, and to complete the arrangements with these London merchants who had agreed to advance the funds necessary for the undertaking.

The granting of the patent was somewhat delayed by the internal affairs of the Virginia Company; but was finally granted on the 19th of June, 1619, not however to the Puritans as a body or association, but in the name of John Wincot (or Whincot), who is described by Bradford as "a religious gentleman then belonging to the countess of Lincoln, who intended to go with them." The reason for this, no doubt was, that granting a patent to an individual would not cause so much remark or opposition as would be the case, if granted to the Puritans in their own names; but the patentee never went with them and is never heard of again. The patent being granted, the next step was to secure the financial aid promised by the London merchants, and here was the delay; for the London merchants were more prompt in their promises than in the keeping of them. And while they were endeavoring to arrange this matter, a proposition was made to them from another quarter, by their old friends the Dutch, who had given them a home for twelve years and who, in that time, had learned to appreciate the sterling integrity of their guests and their value as citizens and settlers of a new country. The States General had passed an ordinance declaring it to be "honorable, useful and profitable to discover new countries, and promising to those who did so the exclusive right of navigating to the new country for four voyages."*

The directors of the New Netherland Company, who claimed to be the discoverers and first finders of the countries between New France and Virginia, had enjoyed this privilege under the above general provision, but their charter having expired by its terms, every one was at liberty to sail there and to engage in trade; and in order to secure again for themselves the sole privilege of this profitable trade, a petition was sent by the New Netherland Company to the Prince of Orange stating "that there was residing at Leyden a certain English preacher, versed in the Dutch language, who is well inclined to proceed hither to live, assuring the petitioners that he has the means of inducing over four hundred families to accompany him thither, both out of this country and England, provided they would be guarded and preserved from all violence on the part of other potentates, by the authority and

* Brodhead's His. N. Y., vol. 1 p. 60.

protection of your princely excellency, in the propagation of the pure, true Christian religion, in the instruction of the Indians of that country in true learning and in converting them to the Christian faith, and then through the mercy of the Lord, to the greater glory of their country's government to plant there a new Commonwealth. All under the order and command of your princely excellency and the high and mighty Lords States General. And whereas they, the petitioners, have experienced that his majesty of Great Britain would be disposed to people the aforesaid lands with the English nation, and by force to render fruitless their possession and discovery, and there deprive this State of its right, and apparently with ease surprise the ships of this country which are there, wherefore they the petitioners pray and request that your princely excellency may benignly please, to take all the aforesaid into favorable consideration, so that for the preservation of this country's rights, the aforesaid minister and the four hundred families may be taken under the protection of this country, and that two ships of war may be provisionally despatched to secure to the State the aforesaid countries, inasmuch as they would be of much importance whenever the West India Company is established, in respect to the large abundance of timber fit for ship building, etc., as may be seen by the accompanying report."*

This petition, in which the true foreign missionary spirit was so remarkably blended with territorial aggrandizement and mercantile activity, was after due consideration, rejected (April 11, 1620), it would seem from the record, upon the ground of furnishing the ships of war; but it is more likely that the real reason was the formation of the West India Company, whose charter was granted in a little more than a year afterward. But before the Pilgrims knew of the unfavorable answer to the petition of the Dutch on their behalf, a new proposition was made to them on behalf of the Virginia Company. The negotiations with the Dutch were broken off and the Pilgrims, accepting the terms proposed, set sail and landed on Plymouth Rock instead of on the island of Manhattan.

The successful departure of the Pilgrims stirred up the Walloons in Holland to make an attempt to secure a home in this country; and in less than a year after the sailing of the *Speedwell* from Delft Haven the British minister at The Hague was approached on the subject by a delegate from the Walloons. The minister, Sir Dudley Carleton, wrote home as follows: "Here hath been with me of late a certaine Walon, an inhabitant of Leyden, in the name of divers families, men

* N. Y. Col. New Holland Doc., vol. 1, p. 22.

of all trades and occupations, who desire to goe into Virginia, there to live in the same condition as others of his majesty's subjects." This spokesman on behalf of the whole body was, without doubt, Jesse de Forest, a dyer; for at the same time he presented a petition, which is preserved in the public record office at London, signed by himself on behalf of the rest. This petition is divided into seven clauses, or sections, which are, very briefly, as follows: First, whether his majesty would permit fifty or sixty families of Walloons to settle in Virginia, and whether he would protect and defend them and maintain them in their religion. Second, whether his majesty would furnish them for the voyage with a ship equipped with cannon and other arms, in addition to the ship they would furnish, in order to carry them and their families and their cattle. Third, whether upon their arrival in said country he would permit them to select a convenient spot for their abode. Fourth, whether they would be permitted to build a town and elect a governor and magistrates. Fifth, whether his majesty would give them cannon and grant them the privilege of manufacturing powder, making bullets and casting cannon. Sixth, whether his majesty would grant them a territory, say sixteen miles in diameter, which they might cultivate and improve, and prevent others settling therein unless they had taken letters of citizenship. Seventh, whether they would be permitted to hunt and fish and cut timber for ship-building and commerce; all of which provisions should extend only to themselves and their families, without admitting those who might come into the territory, excepting so far as this grant might give them the power.* This petition was accompanied by a most curious document, which is still preserved in the British public record office at London. This document is eighteen inches long by thirteen inches and a half wide, and in the center of the paper is the following inscription in French: "We promise his lordship, the ambassador of the most serene king of Great Britain, that we will go to settle in Virginia, a part of his majesty's dominions, at the earliest time practicable, and this under the conditions set forth in the articles which we have communicated to his said lordship, the ambassador, and not otherwise." Around this promise in the center are the signatures of the men and their trade and occupations; and outside of their signatures, but opposite the individual's name is the letter "f" for wife and also the number of children he had, while opposite some of the names are the words "marriageable men."

To this petition of the Walloons and the round robin accompanying

* Baird's Hist. Huguenot Emigration, vol. 1, 159–62.

it, the Virginia Company made reply that they did not conceive any inconvenience at present to suffer sixty families of Walloons and Frenchmen to go and inhabit Virginia, providing they took an oath to be his majesty's faithful subjects, and provided they made profession to agree in points of faith, and to be conformable to the form of government established in the Church of England. But they esteemed it so royal a favor in his majesty and so singular a benefit to the Walloons and Frenchmen to be admitted to live in that fruitful land under the protection and government of so mighty and pious a monarch as his majesty is, that they ought not to expect of his majesty any aid of shipping or other chargeable favor, and as for the company itself their stock is so utterly exhausted, that they cannot give them any help, and can only advise and counsel them as to the cheapest transportation of themselves and goods, and as to the most frugal and profitable management of their affairs. And further, that they do not consider it expedient that all the families should settle as an entire body in any one place, but that they should be located in different cities and villages as they might choose, which they consider, judging from their experience, would prove to be better and more comfortable to them than the way they proposed. This reply, while not refusing the permission to emigrate, was not very assuring, and it cannot be supposed that the felicity of living in so pious a monarch's dominions, or even the good advice that the Virginia Company would give them, could be considered a full compensation for the denial of the ship they asked for and the means of protection they required. Their demands do not seem to have been extravagant; and as they were not granted in the most important particulars, the negotiations with the Virginia Company came to an end.

But while Jesse De Forest was negotiating with the Virginia Company, the States General of Holland were in session and were preparing the patent conferring the extraordinary powers I have mentioned upon the West India Company. The government had kept themselves well informed of the intention of the Walloons to emigrate, and had rightly considered them a most desirable people with whom to form a new colony. Before the West India Company had actually commenced operations, this active leader of the Walloons had laid before the States of Holland and Westfriesland his plan of emigration, and had received from the directors of the new company to whom it had been referred by those provincial States, a most favorable report, to the effect that such a plan would be advantageous to the company, and that an effort ought to be made to promote it, and with a promise that they should

be employed; but it was suggested, however, that final action should be postponed until the board of directors should be formed, if the assembly thought proper that this promise should be made to them; which being considered by the lords, gentlemen and cities, it is unanimously resolved and concluded that the said promise shall be given with the knowledge of the magistracy and to proceed with it accordingly.*

De Forest also presented a petition for leave to emigrate before the States General of the United Netherlands. From the report made by the Councillors of Holland to that august body, it appears that he had applied to the States General for their permission to several families or individual colonists, professing the Reformed religion, to undertake the voyage to the West Indies for the advancement and promotion of the West Indies Company. The report favors the granting of the request on the condition that De Forest shall do this with the knowledge and concurrence of the several cities in which he shall make the enrollment; and that he shall be held to make return of the same to the States of Holland.†

This report was dated August 27, 1622, and early in March, 1623, the ship *New Netherland*, "whereof Cornelis Jacobs, of Hoorn" (or following the English nomenclature, Cornelis Jacobson Mey), was the skipper, sailed from the Texel "having on board a company of thirty families, mostly Walloons." The voyage occupied about two months, and they arrived at the mouth of the Mauritius or Hudson river in May, 1623; and then the little company of passengers separated. Eight of them were landed at Manhattan to take possession of that part of the country in the name of the West India Company. Two families went toward the east to make a settlement near the Fresh, or Connecticut river. Four couple who had been married at sea, were sent toward the South or Delaware river, at a point about four miles below the present city of Philadelphia. Eighteen families remained on the ship, which now proceeded up the river and made a landing near this city; where they built a fort which they called Fort Orange, around which hastily constructed bark huts soon appeared. It would be interesting to know the names of these eighteen families comprising the first settlers of Albany; but on examining the names on the "round robin" to which I have before referred, there is but one name connected with the early history of Albany; and that is the young student of medicine, Johannes de la Montagne. After remain-

* Baird's Hist. Huguenot Em., vol. 1, pp. 60 and 35; Doc. relative to Col. Hist., N. Y., vol. I, p. 28.

† Baird's Hist. Huguenot Emigration, vol. I, p. 69.

ing here a short time he returned to Holland, accompanied by the widow and children of the leader, Jesse De Forest, who died three years after the landing of the Walloon colonists. In Leyden, on the 27th day of November, 1626, he married Rachel, the eldest daughter of the leader; and ten years later he returned to the colony and was known as Dr. de la Montagne, the learned Huguenot physician. He at once took a prominent place in the colony, became a magistrate at Albany, and succeeded Johannes de Decker as vice director and deputy at Fort Orange, September 28, 1656. He was a man of many and varied acquirements; and the early records of this county, as we find them in books A and B of Deeds in the Albany county clerk's office, show that all the legal business of the settlement, such as deeds, mortgages, contracts, wills, inventories of real estate, marriage contracts, licenses, powers of attorney and many other legal forms and customs that are now out of use, were drawn up and acknowledged by him, as the officer in the service of the West India Company, clerk and vice director at Fort Orange and the village of Beverwyck.

In conclusion, attention must be called to an error as to the date of the Walloon settlement here, into which Mr. Weiss has fallen. In his history of Albany, in a note to page 19, he says: "Although the writers who have quoted Wassanaer (the Dutch historian) as their authority for their statements that the *Niew Nederlandt* sailed in March, 1623, to the Mauritius river with the first colonists of New Netherland, they as it will be seen by referring to Wassanaer, do not use his dates, which are plainly printed on the margins of the pages of his valuable work. He gives 1624 for the sailing of the vessel carrying the first emigrants to New Netherland." The valuable work he refers to is a "Historical Account of all the Most Remarkable Events in Europe," and is rather a record of the earliest years of the existence of the West India Company than a history of the settlement of the Dutch in America. The work was brought to light by Brodhead in his researches in Holland, and there is an abstract of it in the Documentary History of the State of New York.*

Whatever date there may be in the margin of the original work, there certainly is none as regards this fact in the abstract printed in the Documentary History, which reads: "The West India Company being chartered to navigate these rivers, did not neglect so to do, but equipped in the spring — and then the words 'of 1623' in brackets — a vessel called the *New Netherland*, etc.," and there is nothing in the margin to show that any other year is intended. But there is stronger

* Vol. 3, p. 35, small edit.

proof than the mere absence of marginal dates. The permission to emigrate hither was granted to Jesse DeForest and his band on the 27th of August, 1622, as appears by the copy of the acts of the Councillors at Leyden; and it hardly appears probable, in view of their desire to come to this country, that they would delay a year and a half after they had received permission to emigrate. And, besides, Gerardus DeForest, who was of the same occupation as his brother Jesse, presented a petition to the burgomaster of Leyden praying that as his brother Jesse had lately left for the West Indies, he might be allowed to take his place in the practice of his trade. This petition was granted on the 24th of January, 1624, which shows conclusively that Jesse must have left Leyden before that time, and that the date of the sailing must have been March, 1623.

I have thus endeavored to trace the first settlement at Albany, the causes that led to it and by what company the emigrants were sent out. And it is certainly a striking fact, that the English emigration of the Pilgrim fathers would have been planted here, had the application of the Dutch skippers prevailed; but the Dutch government declining to send them because of the steps that were about to be taken for the formation of the West India Company, the Pilgrim fathers renewed the application to the Virginia Company that had been suffered to drop, and came to Massachusetts under English auspices. On the other hand the Walloons seeing the success of the Pilgrim fathers in their negotiations with the Virginia Company, applied to be sent out under the same protection. This application was denied, and they then turned to the West India Company, who sent them as a colony to the Dutch possessions in New York. Neither emigration came here in the way at first proposed, and each of them was accepted by the company that refused the other; and so it happened that New York became the home of the French Huguenot and the Walloon Protestant, instead of sheltering the English Puritan.

SOME VIEWS CONNECTED WITH THE QUESTION OF COAST DEFENCE.

By Verplanck Colvin.

[Read before the Albany Institute, Feb. 5, 1889.]

Mr. President and Gentlemen of the Albany Institute :— Last August, while encamped with a party of my men at a remote point in the interior of our northern wilderness, intent upon measurements and maps, thoughtless of cities and ships, coasts and cannon, a guide brought — with other dispatches — a letter which has led me to interest myself in the question of the coast defences of the United States.

The diplomatic humilations to which our government has in recent years been subjected, by reason of the weakness of our navy and the unguarded condition of our ports, makes the question of coast defence a matter of profound and serious interest.

There was a time when the mere privateers of the United States terrified the world; when her vessels grappled in close conflict with foreign ships and, with cannon muzzle to muzzle, thundered and fought until the stars and stripes were run up to the masthead of the foe, above the smoke of battle. There was a time when the pirates of the Mediterranean trembled before our ships of war; as they did in former ages before the fleets of Cæsar and of Pompey; but now the armed fishing smacks of Canada restrain our seamen on seas where our revolutionary fathers fished in freedom, and the gunboats of Chili and Japan are no longer to be despised — while England, France, Germany, Russia, Italy and Turkey possess iron-clad fleets that make our navy, in comparison, a subject of derision. It is doubtless true that a great economy has been insured to us by the caution of our government in avoiding extravagant experimental constructions, at a time when ships of war and heavy artillery are undergoing such constant modifications. It is quite probable that American inventive talent will, upon occasion, supply us with more terrible engines of war and more marvelous means of defence; but, when we consider the frequent foreign complications that have recently arisen; the question of the

Canadian fisheries; the Sackville incident; the German outrages upon Americans at Samoa; it would appear that the time for observation and consideration of the methods of other nations had passed, and that a just regard for our national dignity now requires that the strength of our navy should be made equal to its responsibilities and possible duties; and that our coasts should be defended by such fortifications and armaments as would be sufficient to repel any force that could be brought against us.

Before detailing the views which a consideration of this subject has led me to entertain, it is proper to explain the manner in which the remote northern wilderness became connected with the question of coast defence. For this purpose I submit the following letter:

WATERVLIET ARSENAL,
WEST TROY, N. Y., *August* 9, 1888.

Mr. VERPLANCK COLVIN, *Superintendent Adirondack Survey:*

DEAR SIR—I have been detailed by the authorities at Washington to search for a tract of ground suitable for ordnance purposes, that can be secured by the United States. The ground is desired for the establishment of an ordnance proving ground, for the test of all kinds of heavy guns up to the largest that can be made. Hence, a clear, open range of eight or ten miles is required, so that the gun can be fired that distance and the range observed from the ground at firing point or from towers of suitable height. The range should be approximately level, the width from one to two miles, depending on topographical features—if in a valley narrower ground would do. One end (the firing end) should be easily accessible by railroad, *i. e.*, if not directly on a railroad there should be no great difficulty in building a branch to it. This end should permit of the erection of buildings such as shops, magazines, quarters, gun platforms, etc. The remainder may be wild or marshy, and small creeks or bodies of water would not be objectionable; the only requirements being that telegraph and telephone lines may be put up along its length and targets erected at various points. The land, of course, should not be valuable nor crossed by important highways. The tract should, if practicable, be within 100 miles of Troy.

If not trespassing too much on your time I desire to interest you in this matter to the extent of furnishing me information on the following points:

First—Whether there are any tracts of land belonging to the State of New York that would fulfill the required conditions and that could be secured by the United States for the purposes indicated.

Second—Whether there are any such tracts, parts of which belong to the State, the remainder to private parties.

Third—Whether there are such lands belonging to private parties which could be secured.

Any information you can give me on these points will be highly appreciated. I should consider it a great favor if I could consult you personally on this subject in Albany at any time that may be convenient to you, except between the 16th and 21st instant.

I am yours very truly,

FRANK HEATH,

Captain of Ordnance, United States Army.

In considering the request of the ordnance officer relative to the selection of a suitable location for such a proving ground and cannon range in the northern district of the State, I was able to avail myself of the numerous measurements of distances made in the Adirondack region by the survey under my direction. It was surprising to find how few valleys existed in which a direct unobstructed range of ten miles could be had. The best ranges that could be selected, within the one hundred mile limit, were usually lake and river basins where the use of chronographic screens for testing the velocity of the shot would be difficult.

The following locations were, among others, suggested:

1. The valley of the south bay of Lake Champlain, from the lake shore southwestward into the pass towards the Palmerstown mountains.

2. The valley of the Schroon river above Schroon lake.

3. The valley of Lake Sanford, in the vicinity of the great Adirondack iron deposits.

4. The valley of Indian lake, from the outlet towards "Dug Mountain."

These lands possessed the requisite range-distance, cheapness and freedom from any dense population that might be annoyed or endangered by the fire of the heavy ordnance. Only one location, the valley of the south bay of Lake Champlain, possessed the merit of accessibility by railroad; which is really essential as a means of conveying the great guns to their proving ground.

On consideration, I felt it my duty to urge the following objections to the selection of any such proving ground in the Adirondack region:

1. The great depth of the winter's snows would, at times, render any proving ground located in the Adirondack region almost inaccessible.

2. Convenience in testing the guns would be greater if the proving ground were nearer the place of manufacture.

3. The conditions for firing, amid the mountains, were different from those to be met with at the sea coast, where the guns might be fired at ships in the horizon. The targets should be iron-clad floats, to secure to the gunners, in their trial practice, the skill essential in battle. Unless the gunners were accustomed to the atmospheric conditions peculiar to the sea horizon — conditions of peculiar atmospheric refraction, called "looming", and the like — it seemed to me much of the value of their practice would be lost.

4. The last objection was that the talented engineer officers, detailed in charge of the work of testing and proving the great guns, and also the large number of subordinate officers and enlisted men, would be located so far from civilization; if the range were placed among the mountains; that the isolation and inconveniences would be annoying and at the same time unnecessary, if a good location could be found nearer the arsenal.

These views were mentioned to the officer with whom I had been in correspondence, and other locations were considered, viz.:

a. The sand plains in the rear of the city of Albany, extending from the western limits of the city nearly to Schenectady.

b. The low-lands in the vicinity of Wood creek, between Oneida lake and the city of Rome, N. Y.

c. The nearly level sands upon the Long Island coasts, as those at Montauk point, etc.

Of these sites the sand plains, near Albany, are the most accessible to the Watervliet arsenal, but I questioned whether the heavy concussion of the cannon firing would not be injurious to property in the city and annoying to our citizens; while the roads over the plains would be rendered dangerous for use by the shot and shell, proving the guns. These objections, I was advised, might be overcome by locating the firing point some four or five miles from the city, and placing sentries on the roads at firing hours to warn travelers of the danger of crossing the range.

Since these consultations I have had the pleasure of examining the work now in progress at the arsenal and have been gratified to learn of the admirable plans for the work to come. The work at the Watervliet arsenal is extremely creditable to the ordnance officers in charge and should be better known. Magnificent steel guns, similar to those of the great German manufacturer Krupp, are now being made at the arsenal. The guns are constructed of wrought steel tubes of enormous size, reinforced by huge steel jackets, marvelously turned and

fitted. The huge siege guns of extraordinary length; the enormous and beautiful lathe, in which the steel tubes are so accurately turned; the great cranes by which these tremendous guns are moved and shifted into a vertical position to receive the sections or jackets of hot steel with which they are built up; the numerous new breech-loading field guns, rifled thirteen pounders, polished within and without as bright as burnished silver, are all interesting evidences of the active, intelligent and valuable work now being done by the ordnance department of our army.

I am informed that the board of officers assigned to the duty of selecting the cannon range or proving ground for the heavy ordnance of the army, have arrived at a conclusion and selected a site for the great range. This, together with other information, is given in the following letter:

WATERVLIET ARSENAL,
WEST TROY, N. Y., *December* 17, 1888.

MR. VERPLANCK COLVIN, etc.:

DEAR SIR — The matter of securing a good proving ground for our cannon was definitely fixed by the commission of which I was a member. It was decided that the ground now held by the government at Sandy Hook was the best that could be found, and would answer our purposes, providing certain improvements were made. This decision was approved by the Washington authorities and an appropriation has been asked of Congress of $25,000 (to begin the improvements) — and I have no doubt will be granted. The Albany range (sand plains) was found too contracted, necessitating the firing point to be located very near the city of Albany, and terminating in frequented roads near Schenectady, that could not be closed.

We are now making twenty-five three and two-tenths inch field guns, weighing eight hundred pounds each, and firing a thirteen pound projectile, with three pound charge; also one ten-inch and one eight-inch sea coast gun. These are all steel built up guns, consisting of tube and jacket and numerous hoops assembled by shrinkage. The ten-inch fires a five hundred pound projectile and the eight-inch one of half that weight.

Other papers, including the general orders of the chief of ordnance, etc., contain other interesting details.

The letters I have read show how I became interested in the questions involved, leading up to the general subject of coast defence. The feature of the question at present important to dwell upon is the need of haste in the preparation of our armaments. For this there are two reasons:

First. The restoration of the naval power of the United States.

Second. Security of the sea coast cities against sudden, unannounced attack.

To show what a scientific society, in an inland town, can accomplish by the consideration of such questions, I beg to call your attention to one of the oldest publications of the Albany Institute.

John Ericsson, in his account of the origin of the revolving turreted monitor, expressly disclaims having originated the revolving turret battery, which, on the iron clads of his design, gave such strength to our navy in the last war. Ericsson, after mentioning several early designs for floating batteries, gives to Abraham Bloodgood, of Albany, the credit of having laid before "The Society for the Promotion of the Useful Arts" — the first department of the Albany Institute — an illustration and description of a "floating, revolving, circular tower" battery, for naval warfare and harbor defence. This was in 1807. A Scotchman, Mr. Gillespie, in 1805, modeled a movable castle or battery, but we are not able to say, in default of any drawing accessible now, that his device represented in any way the modern monitor turret.

To a member of the Albany Institute, therefore, is to be attributed the first idealization of the monitor iron-clad turret; which, perfected by Ericsson, formed the invulnerable defence of our coast during the rebellion.

The Albany Institute has, therefore, a right to interest itself in the question of coast defence, which is, indeed, one of the most important questions of these times. Our great cities of the sea coast are the depots of the nation's merchandise. Upon the welfare of New York's metropolis depends, vastly more than is generally imagined, the success of business enterprise throughout the country. The failure of the banks of New York would convulse the nation; how much more would the bombardment, assault, capture and sack of the city by foreign foe, hurl destruction upon all our industries! Yet there are those among us whose ears still tingle with the hoarse reverberation of the British bombardment of Alexandria; and the Egyptian sands are still reddened with the blood of those who dared to resist. American soil has known the work of modern vandals, whose wanton destruction of life and property should be recalled to prevent the forgetfulness on our part of the terrors and irreparable injury that can be inflicted by even a piratical foe. To remind us of how such scenes appear in America, let me read from an old family letter by a relative who was an eye witness of the destruction of Washington by the British in 1814.

August 27, 1814.

* * * * * * * *

"It is impossible to describe the scene of distress which we have passed through during the last week, after our capital was taken possession of by the enemy, and it was evident that our government was unable to afford us any protection. A deputation from this town consisting of Dr. Muir, Dr. Dirch and myself, went up with a flag to the commander-in-chief, General Ross, to ascertain what we had to expect in the event of our town (Alexandria, Virginia) falling into their possession. Never shall I forget the awful and melancholy impression made upon my mind upon that memorable day. Just after we had passed the large ropewalk, on our way, we were overtaken by the most tremendous hurricane ever witnessed in this part of the world. The ropewalk was on fire, and the wind blowing directly from it to us, brought fire, cinders and smoke in such a manner that our hack was filled with ashes and our horses covered with it. Fire, mingled with the rain, ran along upon the ground for a hundred yards before us here. We could scarcely see and the horses scarcely be held. The navy yard in flames upon the right. The capitol in front. The president's house and war office, etc., on our left, and the ropewalk behind us, all in flames, presented a scene which I can only compare to the conflagration of the last day."

That scene of national disgrace must never be permitted to be re-enacted by foreign foe in America. It can only be prevented by preparation, fortifications and armaments, whose adequacy and perfection will be best insured by the watchfulness and care of those who are to be protected. It is the duty of every citizen of the United States to aid, support and encourage, as far as may be in his power, the construction and maintenance of our seacoast defences.

If our country is the most fortunate in its government of any upon earth; the land of Christianity and the school-house; if we are so prosperous a people as to be the only ones to whom a surplus of money is a source of annoyance, rest assured that the eyes of hungry despotism are upon us, and that if we neglect to construct sufficient defences for our coasts and harbors, sooner or later we shall suffer the consequences of a negligence akin to idiocy. We cannot depend upon the boasted civilization of Europe as a safeguard from aggression, if our own supineness and inefficiency indicate that we may be an easy prey to a warlike power. The Christianity of kings is still too often the outward form that cloaks the politician. Selfishness like that of Charles V, of Philip of Spain, the Duke of Alva, of Tilley and of Wallenstein still pervades the breasts of the ambitious and hinders the march of Christian progress.

Yet, it is not of Spain, of Italy, of Austria or Germany that modern civilization has had especially to complain, for Christian England has much to answer for, in permitting greed of mercantile gain to lead it to the most unjustifiable exercises of power. Consider the opium war waged by Great Britain, in the interests of its merchants, upon the almost helpless Chinese: a war of spoliation, incited by the lust of gain, which was only to be had by means of the degradation and most loathsome demoralization of a people whose rulers protested fruitlessly against the traffic. Fresh from the conquered fields of Hindostan the English opium ships sailed into Chinese ports, bringing for years their cargoes of misery to blight the beginning of civilization for Asia's greatest nation. A trade which was forbidden by Chinese laws as early as 1796, in a drug; whose importation was punished by transportation and death to the native offender; was urged on by the magnificent smugglers of the greatest Christian nation upon earth; protestant England; until the name of Christian must have sunk in the estimation of the poor Chinese to the level of the Malay pirate. While English missionaries toiled and slaved to bring the gospel of salvation to the people of China, English merchants destroyed the faith by acts faster than it could be built up by words, even the most eloquent, and for the sake of the gains to be had in the illegal importation of opium brought curses on the name of Englishman and Christian. And what did the English government do? Did it send its cruisers to arrest or turn back the English violators of Chinese law, these poisoners of a nation? No.

As in our city of Boston in 1773, the cargoes of tea which represented trans-oceanic tyranny were cast into the sea, so the Chinese in 1839 demanded the destruction of the pernicious drug which was ruining their people, in violation of laws and treaties. Unlike the Americans, however, they secured the assent of the British superintendent of trade, Col. Elliot, and with his sanction the Chinese took and destroyed more than 20,000 chests of opium: not seized and sold as contraband, smuggled goods but, for moral reasons, utterly destroyed. Such was the protest of China. What was the result? The floating armaments of England descended upon those unhappy coasts, shot and shell were hurled upon the defenceless inhabitants, sea-port after sea-port was visited with the horrors of war, the cities of the interior were entered and captured, and then, when all had been done or taken that they cared to do or take, an indemnity of millions upon millions of dollars was exacted from the stricken people whose ravished homes in smoking ruins at length convinced them of

the true nature of the vaunted "European civilization." Then they were kindly treated, they were permitted to retain what they had left. They were compelled to legalize the opium trade and to adopt an *ad valorem* tariff of but five per cent upon importations from all foreign countries. So, it seems that it was practically the wish for free trade in a demoralizing drug that induced England to make war on this defenceless nation.

After all, was it not the fault of the Chinese themselves? Why do they play the part of a modern Mexico for latter-day conquisadors? If their coast defences had been properly attended to; if they had possessed superior artillery and sufficient store of munitions of war; if they had possessed trained military forces and an adequate navy, England would never have dared to attempt to regulate the custom house of China by the strong arm of military force.

But the Chinese could hardly have known that this was but one of the many repetitions of European history. Torn by internal political convulsions they were unable to appreciate the extent of the errors of government which their political parties — the individual, self-seeking and selfish craft — which among their merchants and their soldiers, alike hurried them on to the inevitable end. Yet China possessed statesmen who gave their lives to secure the public welfare. But of what avail is the effort of the individual, however clear his mind and noble his purpose, if the people are sunk in the slothful love of selfish gain to the end of voluptuous enjoyment? Such is the sleep of death, that goes before decay; the opiate of ordinary sensualism which draws men down from God and godliness to animalism.

Still we may learn from the words of the dying Chinese general, Tso-tsung-tang, how that true statesman urged upon his Emperor the interests of his country:

"Your majesties' gracious favor unrequited. Your servant, sick unto death, utters these words. Your servant, a poor scholar of books, by the imperial favor now become commander-in-chief of the army, in anguish begs you to guard this people, around whom are gathered the nations of the earth, watching like glaring beasts. Therefore let your majesties, out of the deliberation of the high offices, in regard to the coast defense, come speedily to a decision. Let railways and mines, and the construction of ships and guns be undertaken at once, as a means of insuring our national prosperity and strength. As understanding is at the root of all successful undertakings, let your majesty the Emperor at the same time attend with

more and more diligence to the study of the sacred books. Be not remiss, even in the smallest matter. Associate daily with men of principle and listen to their counsels. Be sparing in every-day life that there may be a fund for unforeseen circumstances. Let the Emperor and his ministers strive with one accord, in all ways that are right, and your servant will seem in the day of his death to be born again into life."

It is useless to say that these are the words of a pagan and an ignorant man; of a chieftain in an empire half way round the world. Pagan, indeed; but yet a patriot was this Chinese general, and if his despair was so great, if his anguish was so extreme at the sufferings of his people from European tyranny at so vast a distance, does it not behoove us, who are but six days from the shores of Britain, to guard our coasts from similar depredation? It is not so long since the armies of the French emperor swept the coasts of Mexico and drove the president of the republic to the very borders of our own land. True, the blood of Maximilian wiped away the insult and turned the crime into a dreadful warning; but is it not our strength of arms alone that prevents a repetition of the offense by a European conquest of Panama?

History is said to repeat itself, yet it is mankind — or rather most unkind man — still selfish; as of old; false, treacherous, grasping and murderous, that ever reaches out a robber's grasp to take by cunning or by force the possessions of those who are so credulous or unwary as to expose themselves, and to thus become the easy victims of avarice. I speak of these recent occurrences only to remind, that the murderous avarice of mankind is as great to-day and as unscrupulous as it was in the more warlike times of Crœsus or of Crassus, of Sylla or Lucullus. Whenever there is unbridled luxury there must be means to supply the continual waste; and, where extravagance becomes a war of waste, wars alone will support it.

Let us not be deceived into a false security. Where there is a heedless nation some foe has eye upon it. Consider the vaults of the treasury at Washington, heaped with silver; what buccaneer ever reaped such spoil since the days when Francis Drake sacked the towns of the Spanish main? Consider the treasures of New York, of Philadelphia, of Boston; and, in the event of war, we would have more powerful warriors to deal with than a Cortes or Pizarro. Instead of mail-clad knights, we should have floating islands of iron and steel, against which we have made, as yet, but the commencement of a preparation.

It is poor policy to say (without knowledge) that the European iron-clads cannot cross the ocean; that they are so weighted down, clumsy and cumbersome, that they would sink in the billows of the first great storm. Suppose no great storm should occur? Suppose them within the harbor of our great metropolis, and what is there that would long hinder their entrance? Dynamite? The first shell from a hundred-ton gun that should enter an old-fashioned magazine would send dynamite, fort and all up to the heavens. Once anchored within the port of New York, the commanders of European iron-clads need limit their demands for ransom only to the means of transportation afforded by the captured shipping in the port. These are not the days of chivalry. Even the code duello is no more; and, though we hear much of international law, the grim procession of the iron-clad fleet of the enemy entering a harbor is often the first announcement of hostilities. It is not safe to assume that neutrality would protect should the complications of war entangle us. The mistress of the seas has, more than once, assumed that those who were not with her were against her.

Self-defence is the cry and fear the inspiration that too often lead to the most dreadful exercises of arbitrary power. Copenhagen, the peaceful capital of Denmark, told this story plainly to the world in 1807. Denmark was at peace. With England, especially, government and people were closely allied in friendship. The Danish army, hostile even to Napoleon, watched the frontiers of the kingdom. Suddenly fear seized the British government. Someone dreamed that the Danish navy might be captured by the French and used in a descent upon England. War was not declared; but, secretly, twenty-five great ships of the line and forty frigates, with three hundred and seventy-seven transports, conveying thirty thousand troops, appeared within the harbor of Copenhagen. The immediate surrender of the Danish fleet was demanded, and, when it was refused, shot and shell, fire and flames swept the defenceless city. Half the city was in flames, its beautiful churches were in ruins, thousands of citizens, men, women and helpless children, were murderously destroyed in the indiscriminate massacre. Blood, smoke, fire, ruin, murder were the amenities of civilization that Arthur Wellesley and Lord Gambier meted out at the command of a British ministry to a friendly capital without declaration of war. Was this an act of friendship? Oh! no. It was spoliation pure and simple. Piracy upon the high seas; robbery upon the land — for from that ruined, blood-stained city the victors drew in prize-money nearly five million dollars. They stripped

the town. The Danish shipping and naval stores, thirty-five hundred pieces of artillery, and even the timber in the ship-yards were swept away — mementoes, possibly, of this occasion of extraordinary friendship.

We need not refer to the history of former wars for such acts of aggression. At this moment Aziatics, freshly landed on the coast of Abyssinia, have made war upon the inhabitants, who never did them injury. The Prussian ships of war bombard the sea coast towns of the Sultan of Zanzibar. The Italian iron-clads carry death into the Arab towns, and German cruisers, without waste of paper declaration, ruthlessly destroy the lives and property of the inhabitants of Samoa — careless, indeed, of injury to Americans or English.

It is only the abundance of our mills, our forges and our factories, and the greatness of our population, taken together, that intimidate the armed foes of our republican form of government. It is important to show the world that these mills, forges and factories, if it be necessary, can be speedily turned from the paths of peace to the preparation of the material of war. It may be vitally important for our mechanics everywhere to be familiar with the construction of ordnance and arms, and that forges and machine shops should be equipped with the special machinery necessary. Remember that these are not days of peace. It is the reign of armed watchfulness. The modern terror. All alike fear war. Its horrors now approach to those of the days of wrath, so war is no longer declared; it is made.

The fleet arrives. The demand comes. It is not now a question of diplomacy, for the hungry dogs of war are there eager for prize-money. The rich city is their hoped-for spoil, and the thunder of the cannon proclaims the doom of rich and poor alike. Affluence and misery mingle their blood with the ashes of this last sacrifice to folly. The treasures of art are crumbled into dust. Records and history melt away and disappear in the unchecked conflagration; while famine and pestilence complete the ruin and a dead metropolis — silent and untenanted — seems like a place accursed of God.

Let us delay no longer. The English iron-clads alone carry some 6,000 heavy guns; let us have within a year an equal number. Let us have as many swift cruisers upon the seas as England, and let every great port in our country contain a squadron of swift torpedo boats of steel, manned by dauntless officers and seamen. Let there be dynamite guns for every port, and perfected torpedo systems, and an abundance of that form of arms in safe magazines. Let the entrances

to each great harbor in our country be guarded by impregnable forts of iron and steel, with turrets the most perfect, the works re-enforced by inland intrenchments for infantry supports. Let monster guns be placed on hydraulic tables in masked turret batteries, made flush with the earth's surface and fired with the aid of azimuth distance signals, so arranged as to have absolute command of the straits and channels leading to our great cities of the sea coast. Let there be special strategical railroads, built to the sea coast, to the forts and intrenchments, so that troops and munitions may be moved to the front when needed. Let more men be trained and drilled; let the forges bring their steel; let the mills hammer it into ingots or roll it into plates. Let us be ready. Not "sometime," but now.

Then, possessed of the power to enforce our rights, accustomed by our system, by our theory of government, to a just consideration of the rights of others, the name of American shall be greater than that of king, and the flag of our nation shall gleam as brightly and as proudly in these days as when John Paul Jones swept the English channel; as when Perry and MacDonough won victory upon the lakes, and Porter and Farragut upon the seas.

* * * * * * * *

Let me add that it is not from enmity to England that I have selected so many of the examples of unannounced war from the annals of her history to illustrate the dangers which, it seems to me, are not sufficiently considered by our people. It happens that the naval history of England contains more examples of the "strategy" of sudden attack, to give it a mild name, and more dreadful memories of the results of heedlessness on the part of her opponents, more opportune lessons than history elsewhere affords.

For any nation violating laws divine and human, for sordid purposes of mercantile gain, we can have only a natural horror. England's faults appear to have been chiefly those of her politicians and of an unscrupulous class of political merchants, whose selfishness and narrowness have alone prevented the supremacy of English civilization throughout this world. Political narrowness, born of egotism and fear, has sought to make the colonies subservient to the personal ambition and interests of residents of the island of Great Britain, rather than agencies for the advancement of civilization by the establishment of God-fearing, law abiding nations throughout the earth.

Yet to be an Englishman is to be assured of the watchful protection of one of the most powerful of modern governments; a protection which is sought of all governments, but which is most imperfectly

afforded to Americans in distant lands. The protection of its citizens was one of the grandest features of the governmental system of ancient Rome. The safety and freedom of a Roman was the jealous care of that state, until slavery and sensualism had dimmed the glory and lowered the intellectual force of Rome. Then the wearied nations of the earth cried aloud for its destruction, even as Rome itself had demanded and secured the destruction of Carthage.

Let us hope that the English people will rise above their politicians and political merchants, so that we may never be compelled to re-echo for England the cry of Cato the censor: "*Ceterum censeo Carthaginem esse delendam.*" We want no war. We want no standing armies. We insist upon peace; but we also insist upon justice and the protection of our citizens. To secure peace we must make our coasts impregnable. To secure justice and full protection we must cover the seas with swift steel cruisers — not clumsy ironclads. Then, if just towards others, we may hope for the blessing of heaven, with prosperity and contentment.

EDIBLE WILD FRUITS OF NEW YORK.

By CHAS. H. PECK, New York State Botanist.

[Read before the Albany Institute, April 16, 1889.]

We read that when the Israelites were upon the borders of the promised land, they sent forward certain men to examine the country, and see what kind of a land it was; whether a lean land or a rich land. As an evidence that it was a rich land, and one flowing with milk and honey, they brought back with them specimens of its grapes. The same method of judging of the character of a land holds good to this day. If it produces, or is capable of producing, an abundance of good fruits it is a goodly heritage. California, formerly famous for her gold mines, is now becoming more famous for her excellent fruit, which is destined to be, at no distant day, of far more importance and value to her than all her mines of precious metals.

The wild fruits of a country furnish something of an index to its character and its capability as a fruit-producing land. If wild grapes abound it is pretty good evidence that they would thrive under proper cultivation. If blackberries do well and are excellent in a wild state it is reasonable to suppose that they would do better with proper care and culture. I have therefore thought that a brief dissertation upon the edible wild fruits of New York would not be without interest.

By the term "fruit" we include not only the seed of the plant and the encasing walls of the ovary or seed vessels, but also whatever parts are consolidated with it. In many fleshy fruits this will include the thickened, or enlarged, persistent calyx, tube or cup of the flower, and in some instances the very receptacle which supports the flower. It is needless to say that a fruit, to be edible, should be digestible, nutritious, healthful and palatable. Wild fruits are those which grow without cultivation. They may be either native or naturalized. Other things being equal, those fruits are best that are seedless or have such minute seeds that they are practically seedless. Blueberries are examples of a fruit with minute seeds. Some varieties of the blackberry are objectionable because of their coarse seeds. The grape which has a tough pulp is less desirable for eating than one with a tender pulp, because of the difficulty of extracting its seeds,

which are too coarse to be swallowed with satisfaction. A fruit whose seed is large and single, as in the peach and the plum, is less objectionable, because its seed is easily extracted. For summer use, especially, juicy fruits are more desirable, inasmuch as they supply the system with an abundance of pure water, a thing which is now quite difficult to obtain in many of our cities and villages. A fruit that in its wild state is variable in size, shape, color and flavor, gives better promise of improvement by cultivation than one that is fixed in its characters, for it shows a greater susceptibility to change of character and gives more opportunity for selection, for the crossing of varieties and for the gratification of different tastes. One that is not particular as to soil and locality, in other words, one that has a wide geographical range, is more likely to be valuable than one that is extremely local. To these general statements it will not be difficult to find exceptions, but these do not invalidate the principle.

Among our apparently wild fruits are some that have been, or still are, cultivated. They have escaped from cultivation, either by the scattering of the seed, or by the neglect or abandonment of the cultivator. The apple, peach and barberry are examples of this kind. We call them introduced or naturalized species, inasmuch as they have been brought here from other localities. They constitute but a small percentage of our edible wild fruits.

Following the order of arrangement laid down in our botanies, the first fruit to claim our attention is the American papaw (*Asimina triloba*). The plant, which is a shrub or small tree, barely enters our State on the west. The fruit is oblong or somewhat oval, varying from one to three inches in length, yellowish in color, and when fully ripe is fragrant, sweet and eatable. The species was formerly reported from three or four stations in the western part of the State, but it has now become very scarce and is, I fear, in danger of extinction from our State flora, if it has not already disappeared. The common barberry (*Berberis vulgaris*) has been introduced into this country either as an ornamental shrub or as a hedge plant, but it has escaped from cultivation and become spontaneous in some places. It bears beautiful clusters of yellow flowers, followed by bright red or scarlet, acid, oblong berries which are sometimes eaten or made into jelly. The plant has a bad reputation in Europe, because it harbors one form of the fungus that causes the rust of the wheat fields.

The mandrake (*Podophyllum peltatum*), called also May apple, love apple and wild lemon, belongs botanically to the same family as the barberry. It is common in many parts of the State, especially in the

eastern, central and western parts. It delights in rich soils and grows both in thin woods and in pastures and open places. It is a perennial herb, spreads by creeping root-stocks and forms patches of greater or less extent. The stems are about a foot high and usually bear two broad leaves and a single fruit which is at the top of the stem. This fruit is of a yellowish or greenish-yellow color and of a soft, pulpy texture. It is equal to a large plum in size, and when thoroughly ripe is edible. Writers differ in their estimate of its quality, some saying that it is mawkish and disagreeable, others that it is hardly palatable, and others still that it has an agreeable strawberry-like flavor. Professor Gray pronounces it sweet, pulpy and eatable. I suspect this difference of estimate is due to differences of taste and to differences in the degree of ripeness of the fruit eaten. In my own experience I have found the thoroughly ripe fruit very agreeably flavored; that which was not so ripe, quite unpleasant. The plant can scarcely be recommended for cultivation for the sake of its fruit alone, since the quantity that could be produced on an acre of land would necessarily be limited, and much less than of many other fruits equally good and more easily raised. The root has long been reputed medicinal, but the leaves when used as a pot herb have proved deleterious.

The yellow nelumbo (*Nelumbium luteum*) has a single station within our limits. There is a large patch of it at the head of Big Sodus bay in Wayne county. This is so remote from other localities of the plant that some have thought the plant may have been placed there by Indians, who made use of its seeds and its tuberous root-stocks for food. The seeds are said to resemble filberts or chestnuts in flavor, and to be improved by roasting. The plant is a magnificant aquatic and worthy of cultivation for ornament, if not for its fruit, for its large yellowish flowers are very showy. I have been told that these are so eagerly sought and have been so thoroughly plucked in the locality mentioned that it is now difficult to obtain them.

Of wild grapes we have four species. These are very variable and it has been somewhat difficult to define the North American species by satisfactory and constant characters. Rafinesque described a large number of so-called species, most of which were mere forms or varieties, which have never been admitted as species by other botanists. The chief distinguishing characters of the New York species, according to the latest and commonly-accepted authorities, may be briefly noted.

The northern fox grape (*Vitis Labrusca*) has the lower surface of its leaves covered with a persistent, cottony tomenture, which is

usually of a tawny color though sometimes it is grayish. The berries are larger than in the other species, being three-fourths of an inch in diameter. The summer grape (*Vitis æstivalis*) has the lower surface of the young leaves clothed with a loose, rust-colored, webby down, which mostly or entirely disappears with age, leaving the lower surface nearly or quite smooth and paler than the upper. The berries are small, being about one-fourth inch in diameter. They are dark blue or blackish, covered with a bloom, and pleasant to the taste. The frost grape (*Vitis cordifolia*) has the leaves smooth or only downy along the veins on the under surface, with an acute cavity at the base. The berries are very small, destitute of a bloom, and generally with but a single seed. The river-bank grape, called also frost grape (*Vitis riparia*), closely resembles the preceding one, of which it has been considered a mere variety by good botanists. Its leaves are glabrous on the lower surface, but the cavity at the base is obtuse, or rounded, the leaves are more pointed and cut-lobed, the berries are suffused with a bloom and often two-seeded, and it blossoms and matures its fruit earlier in the season.

Wild grapes were used as food by the Indians, and the fruit of the fox grape is sometimes employed to this day in making grape jelly. The effect of cultivation upon these grapes is known. Nearly all our present cultivated varieties have been derived from them. To the fox grape we owe the Concord, Catawba, Isabella, Hartford and their numerous seedlings and crosses, such as Brighton, Worden and Moore's Early. From the summer grape have been derived the Herbemont, Cynthiana and Virginia Seedling. The river-bank grape has given us the Clinton, Delaware and others. The difference in size and flavor between these and some of their wild ancestors is remarkable. The cultivated varieties are so superior and have now become so plentiful and cheap that there is little demand for the wild fruit. Still it is not probable that the capabilities and the usefulness of the wild vines are yet exhausted. The late Mr. Caywood, by their aid, has originated promising varieties, some of which, I believe, have not yet been given to the public. The number of named varieties is already legion, and there seems to be no end to the combinations that can be made by crossing and recrossing these. The grape is indeed a noble fruit, a classical and an historical fruit, one of God's best gifts to men, and yet man, as in other instances, has sometimes wrested it to his own destruction, thus proving that the greatest blessings, by abuse, may become the greatest curses.

Passing now to the Rose family, we find it very prolific in species that are useful and ornamental. To it we are indebted for apples, pears, quinces, peaches, nectarines, almonds, apricots, plums, cherries, June berries, blackberries, raspberries, strawberries, etc. Of the genus *Pyrus* we have two introduced, and two native species with edible fruits. Seedlings of the apple (*Pyrus malus*) and of the pear (*Pyrus communis*) sometimes spring up by the wayside or in neglected places, but their fruit is almost always inferior in quality and scarcely fit for any thing except for making cider or feeding to pigs, so quickly does this fruit deteriorate when care and cultivation are withdrawn. Sometimes the remains of old orchards are found standing in the woods. The orchards were neglected till forest trees grew up and overtopped the apple trees. Strange to say, these trees sometimes bear considerable fruit, even when thus surrounded and overshadowed, but in time they are obliged to yield to the greater vigor of the native trees.

The crab apple (*Pyrus coronaria*) is indigenous in the western part of the State. It is a shrub or small tree and has fragrant flowers and fruit. The latter, however, is rather hard and sometimes bitterish, yet it was eaten by the aborigines and was sometimes employed by the early settlers in making preserves and cider. But at present there is no need of using such a poor article. The chokeberry (*Pyrus arbutifolia*) is a shrub, two or four feet high, that bears clusters of dark red or black fruit about the size of huckleberries. When fully ripe the fruit is eatable, but it is somewhat astringent and leaves a choking sensation in the throat, which is suggestive of the name. The tendency to adulterate articles of food that has been so strongly developed in these latter days is sometimes seen in the use made of this fruit. Dishonest berry pickers, taking advantage of the resemblance between the chokeberry and the huckleberry, sometimes mix the former with the latter and sell the mixture for huckleberries. The unsuspecting purchaser finds, when he eats his fruit, that he has paid a good price for a poor article.

In the June berry (*Amelanchier Canadensis*), which is also called service berry and shad berry, or shad bush, we have a more promising fruit and one which has already attracted the attention of nurserymen, some of whom now offer plants of one variety of it for sale. In this State there are at least four varieties of it. The variety *botryapium*, or grape-fruited June berry, is a small tree growing from ten to thirty and, in some instances, even to fifty feet high. Its flowers are in long, drooping clusters, have oblong petals and, being very abun-

dant, they give the tree a very ornamental appearance. Variety *oblongifolia*, the oblong-leaved June berry, is generally smaller than the preceding, has shorter flower clusters and petals, and the branchlets and lower surface of the young leaves clothed with white down. Variety *rotundifolia*, the round-leaved June berry, is shrubby and has broader and more rounded leaves and small flower clusters and short petals. It often grows on very poor or light sandy soil, yet fruits abundantly. Variety *oligocarpa*, the few-fruited June berry, is a shrub of the Adirondack region. It is so peculiar in its appearance in the cold, dark forests that it is at first difficult not to believe it a distinct species. Its leaves are thin, its flowers single, or two to four in a cluster, and its fruit globose or oval and peculiar in flavor. But intermediate or connecting forms have led botanists generally to consider all of these as varieties of one variable species. This variability and the readiness of the species to adapt itself to different soils and surroundings indicate a capacity for improvement under cultivation, and the future may witness a delicious and desirable fruit developed from this plant. The wild berries have sometimes been offered for sale in the Albany market under the name of blueberries, although they have little resemblance to blueberries either in color or flavor. They are inferior to blueberries in being more coarsely seeded. Plants, also, of this species, have been advertised for sale as blueberry plants. Let us hope that these attempts to sail under false colors were due to ignorance rather than to a deliberate attempt to deceive. The name June berry is perhaps an unfortunate one, for the fruit is generally not ripe with us till in July. The blossoms usually appear in May. Two species of thorn, the scarlet-fruited (*Cratægus coccinea*) and the black thorn (*Cratægus tomentosa*), bear fruit that is sometimes eaten, but it is, in both cases, so dry and so coarsely seeded that there is little promise that any thing valuable can be developed from this source.

The genus *Prunus*, as now received, is more comprehensive than formerly, and is made to include peaches, apricots, plums and cherries. The peach (*Prunus Persica*), the garden plum (*Prunus domestica*), and the two cultivated cherries (*Prunus avium* and *Prunus cerasus*) sometimes escape from cultivation and grow wild, but they can scarcely be said to be thoroughly naturalized. Two wild plums bear edible fruit. The beach plum (*Prunus maritima*), as its name implies, grows only along or near the seashore. It is sometimes a low spreading bush one or two feet high, sometimes four or five feet high. Its fruit is from six to twelve lines in diameter and, like other plums,

has a bloom. It is of a pleasant flavor and is sometimes made into preserves. The valuable character of the plant is its ability to grow and fruit abundantly in very poor, sandy soil, even the shifting sands of the seashore, where other species would fail.

The wild red plum or yellow plum (*Prunus Americana*) is common in many parts of the State. It is usually clothed with a profusion of blossoms in the spring, but it often fails to perfect its fruit. There are varieties which bear differently colored fruit, red, yellow or black. The edible quality and showy character of the fruit as well as the fine display of the blossoms make the tree an attractive one and have led to attempts to cultivate it. It matures its fruit early, except in very cool localities, and is hardy, on which account it is desirable for the colder, northern parts of the State, where the summer is short. The Wild Goose plum advertised by some nurserymen is probably derived from this species. There is reason to believe that valuable varieties may be developed from it, both because of its variability and wide geographical range, and because of the improvement already manifested in its fruit under the influence of cultivation.

Of wild cherries we have four species, and though the fruit of all of them may be called edible, it can in no case be said to be very good. The wild red cherry (*Prunus Pennsylvanica*) is locally known as bird cherry, pin cherry and fire cherry. It is a small tree which springs up freely and grows quickly on newly-cleared land in hilly or mountainous districts, but the fruit consists of a very thin layer of pulp over a comparatively large stone. The wild black cherry (*Pyrus serotina*) grows to a much larger size, so that its trunk is valuable for lumber. Its fruit grows in elongated clusters, or racemes, and is about the size of a pea. It has a peculiar sub-acid flavor, but is scarcely desirable as an article of food. The choke cherry (*Prunus Virginiana*) is plentiful in some localities, but its fruit is scarcely eatable unless thoroughly ripe, and even then it has a peculiar astringency that causes an unpleasant sensation in the throat. A variety is found upon the western plains that is said to have a much sweeter and more pleasantly flavored fruit. All these species are sometimes infested by the black-knot fungus, and are thus a source of infection to cultivated plums and cherries. The sand cherry, or dwarf cherry (*Prunus pumila*), though but a small shrub, bears a larger fruit than the other species, but it is often transformed into a peculiar inflated condition known as "bladder plums." This is due to the attacks of a parasitic fungus. A similar disease sometimes attacks the red plum also. We are therefore obliged to write "unpromising" after each of our indigenous cherries.

Of the genus *Rubus* we have nine species, all of which bear edible fruit, though all are not equally good. Five of these are raspberries, in which the ripe fruit separates freely from the receptacle, and four are blackberries, in which the ripe fruit adheres to the receptacle. The flowering raspberry (*Rubus odoratus*) differs much from the other species. Its leaves are simple, its stems destitute of prickles, and its flowers are large and showy, having broad, dark red or purplish petals. It continues long in blossom and it is not unusual to find ripe fruit and flowers on the plant at the same time. Its fruit is broadly convex, often an inch in diameter, but very thin, red in color, and of a peculiarly rich and pleasant flavor. The plant is from three to five feet high and is especially fond of moist or springy places in rocky or mountainous regions. It has sometimes been cultivated but it has failed to become popular.

The red raspberry (*Rubus strigosus*) is too well known to need any description. It grows freely in all parts of the State, except perhaps in the extreme southern part. It is especially luxuriant in the clearings and neglected lands of the Adirondack region, where it is made to supply the tables of the numerous boarding-houses with a most delicious wild fruit and with excellent pies. From this species and from the very similar European or garden raspberry (*Rubus Idæus*) the numerous cultivated varieties, now offered for sale by nurserymen, have been derived. Some of these have creamy-yellow or orange-yellow fruit, but in most varities it is of a red color. The stems, or canes are biennial and bear but a single crop of fruit. Occasionally, early, vigorous shoots blossom and ripen a crop of fruit the first year, especially if warm weather continues late in autumn. This suggests the possibility, by careful selection, of developing an autumnal fruiting variety.

The cream berry (*Rubus neglectus*) has the same mode of growth as the black cap, or black raspberry, but its fruit is more like that of the red raspberry in color and flavor. The stems are very long, recurved, and beset with coarse prickles. They often reach the ground again with their tips and, taking root, form new plants in this way. The fruit has a peculiar, clouded red color with a slight bloom and a pleasant flavor. The species was not described till 1869, but it surely does not deserve the neglect it had received up to that time. It has already been placed under cultivation, for the large and productive variety known among nurserymen and horticulturists as Shaffer's Colossal is clearly the same thing.

The black raspberry, or blackcap (*Rubus occidentalis*) differs from the other species in the black color of the fruit. This is sweet and pleasant, but generally more dry and seedy than the fruit of the red raspberry. The stems grow in tufts, become recurved and take root again at the tips if these reach the ground. The plant is easily cultivated, and from it several varieties have recently been developed. The dwarf raspberry (*Rubus triflorus*) is much smaller than the others, has a prostrate, or trailing mode of growth, and is almost herbaceous in character. Its blossoms are few and it fruits sparingly. The fruit resembles that of the red raspberry, but has a darker red color and is more acid to the taste, though of a pleasant flavor. The plant delights in cool, shaded places, or in swampy woods. It is scarcely probable that it would be valuable for cultivation. The blackberry (*Rubus villosus*) is our most variable species of *Rubus*. There are four quite distinct forms or varieties, though but three of them are defined in the botanies. The typical form has stout, erect or somewhat curving stems, three to eight feet high, and more or less armed with stout prickles; while the young shoots, branches, peduncles and lower surface of the leaves are clothed with villose and glandular hairs. The clusters of flowers are oblong, and the mature fruit is oblong or cylindrical. A variety closely resembling this in size and general characters has paler foliage, and pale, yellowish or whitish-yellowish fruit. No description of it appears in our botanical works, but the nurserymen have already placed it in cultivation and named it the Crystal White blackberry. It is of excellent flavor and novel in color, but the plant is tender and liable to winter-kill in this latitude, unless protected. It is probably due to this character that the wild plants are so rarely seen in this part of the State.

Variety *frondosus* is similar to the typical form in its stems, but the young branches and leaves are less hairy and less glandular; the clusters of fruit are shorter, the petals are shorter, and the fruit is more rounded or spherical in shape, and more coarsely seeded. It is inferior to the fruit of the typical form in size and flavor. It grows more freely in open, sunny places, and will occupy poor sandy soil where the typical form will not thrive. It is a singular fact that the fruit of all cultivated varieties that has come under my observation resembles the fruit of this inferior variety more than the fruit of the typical form. The catalogue illustrations of the fruit of the cultivated varieties also point in the same direction. We are, therefore, led to conclude either that the typical blackberry loses its usual shape when brought into cultivation, or else we must suppose that our cultivated varieties have

been derived almost entirely from the wild variety *frondosus*. Neither supposition seems probable, for I should not expect such a change to be wrought in the shape of this fruit by cultivation, nor should I expect the nurserymen, who generally are good judges of the character of fruits and are eager to introduce the best varieties, to neglect a first-class blackberry and select for cultivation a second-class one. Neither do I see any reason why the typical form may not be domesticated, though it is possible that it may not have been properly treated to secure the best results. In its wild state it is found in its best condition in recently-cleared land, where the soil is rich, porous and well-mulched by fallen leaves, or shaded by dense foliage, and where the briers themselves are partly shaded by trees. In such situations the fruit is cylindrical, large, juicy, tender, sweet and delicious. If this form could only be planted on rich, porous, well-drained and heavily-mulched soil, where the plants could be partly shaded, I see no reason why it may not be successfully cultivated and perhaps improved. Even in its wild state it is, to me, preferable to any of the cultivated varieties with which I am acquainted. If, by proper cultivation, it could be improved it would, indeed, be a most desirable acquisition.

This fruit furnishes us a good illustration of the necessity of cultivation if we would have an adequate supply. Not very many years ago wild blackberries were brought to the Albany market in abundance. It was not uncommon, in the midst of the berry season, to see ten or twelve wagon loads of them in State street market at one time. But the supply has been gradually diminishing until now it is almost nothing. The cultivated varieties have not crowded the wild berries out of the market, but the forests in this vicinity have been exhausted; the land whereon the berries formerly grew has been devoted to agricultural purposes, or else has become covered with a dense growth of young trees which have overgrown and destroyed the blackberry plants, and the berries are no longer to be found. Thus it is, not only with the berries, but also with other things. As the country becomes populous, man cannot depend upon nature alone to supply his wants. He must take the matter into his own hands, and take measures to increase the supply, or else he must come to want.

The remaining variety of the blackberry, botantically called *humifusus*, is smaller than the others, and its stems trail upon the ground. Its clusters are few flowered, and, in habit and appearance, it approaches the dewberry. It has no qualities to commend it for culti-

vation. The dewberry (*Rubus Canadensis*) is very common in old, neglected fields. Its prostrate stems spread extensively over the ground, and, when once established, it is very persistent and is with difficulty eradicated. In very poor soil it is frequently attacked by the blackberry rust fungus (*Cæoma nitens*), which covers the lower surface of the leaves with its beautiful orange-colored, dust-like spores. This fungus sometimes attacks cultivated blackberries and black raspberries, much to the hurt and disgust of the cultivators. The lesson which nature teaches is that well-fed plants are much less liable to attack than starved ones. The fruit of the dewberry is somewhat globular in shape, coarsely seeded, but sweet and pleasant in flavor. It ripens rather earlier than the blackberry, and probably on this account it has been introduced into cultivation. The Lucretia dewberry is generally considered the best of the cultivated sorts. Owing to its trailing habit, it is advisable to tie the stems to stakes to keep the berries clean and to facilitate picking them. The running swamp blackberry (*Rubus hipidus*) is a still smaller plant, with a more slender trailing stem, beset with small bristles or prickles, with almost evergreen leaves, and small, sour, barely edible fruit. It grows chiefly in swamps and cool woods, and is unimportant as a food-producing plant. The sand blackberry (*Rubus cuncipolius*) has a much better fruit, an upright mode of growth, with leaves whitish, wooly on the lower surface. It delights in sandy soil, as its name implies, but it barely enters our southern limits, and is scarcely important to us as a wild, food plant, though its fruit is large and well-flavored, and might be developed into a variety which might be profitably raised on light, sandy soil in more southern localities.

Of strawberries we have two species, the field strawberry (*Fragaria Virginiana*) and the wood strawberry (*Fragaria vesca*). This is also called Alpine strawberry and English strawberry. It is also native in Europe, where it has long been cultivated. From both species most excellent varieties have been developed by cultivation, selection and crossing. There is scarcely a better or more popular small fruit in our market than the strawberry. The annual consumption of it is steadily and rapidly increasing. Many who have them in sufficient quantity put them on their tables every day during the strawberry season, and some eat them three times a day. The opinion is quite prevalent that the wild strawberry is superior in flavor to the cultivated. The cultivated varieties differ much in flavor, but there are some which are scarcely surpassed by the wild ones in flavor, and certainly not in size and appearance. The flavor is influenced by soil, degree of moisture,

amount of sunshine, rapidity of development and degree of ripeness. With proper attention to these things, I see no reason why the wild berries should be any better flavored than the cultivated.

The genus *Ribes* of the *Saxifrage* family furnishes us with gooseberries and currants. Of the former, three New York species have edible berries. The prickly gooseberry (*Ribes cynobasti*) is found in all parts of the State. Its fruit is of a clouded red or purplish hue when ripe, sweet and pleasant to the taste, but objectionable on account of the prickles which cover it. Smooth fruited forms are said sometimes to occur and possibly these might be developed by cultivation into a desirable variety. The two following species have smooth fruits.

The round-leaved gooseberry (*Ribes rotundifolium*) is plentiful in the Catskill and the Adirondack regions. It appears to prefer hilly or mountainous localities. The smooth gooseberry (*Ribes hirtellum*) is more common in the southern and western parts of the State. In both species the clouded red or purplish fruit is sweet and pleasant flavored and on account of its smoothness is preferable to that of the prickly gooseberry. I am not aware of any persevering attempts to cultivate these species, but see no reason why they may not, by cultivation, become as valuable as the European species which now produces large and fine fruit, but which, with us, is often subject to mildew. The red currant (*Ribes rubrum*) is indigenous in the northern part of our county and has been reported wild in a few localities in our State, but in some instances it evidently has escaped from cultivation. It is a very hardy plant and in British America its range extends northward to the Arctic regions. Its fruit is commonly red when ripe, but varieties occur with whitish fruit.

The cactus family yields us a single species of *Opuntia*, commonly known as prickly pear or Indian fig, whose pulpy fruit is eatable. It occurs sparingly in the Highlands and on Long Island and can scarcely be regarded as important or valuable for its fruit.

In the Dogwood family the dwarf cornel (*Cornus Canadensis*), also called bunch berry and sugar berry, produces a beautiful cluster of bright red fruits scarcely as large as a pea. These are sometimes eaten by children, woodmen and hunters, but they are more agreeable to the eye than to the palate, and are barely worthy of being classed among edible fruits.

The genus *Viburnum* of the Honeysuckle family, contains five species of shrubs with edible fruits. These are in each instance about the size of a pea, though in some they are oval rather than globular.

They are produced in broad, flat clusters and are quite ornamental. Each fruit contains a stone, as in the cherry, and, unfortunately for the value of the fruit, this stone is covered with a very thin pulp. The cranberry tree, or high cranberry bush (*Viburnum opulus*) has a red fruit which is very pretty but very acid. Nevertheless, it is sometimes used as cranberries or made a substitute for them. The shrubs are sometimes planted in gardens or door yards, but more for ornament than for fruit. One nurseryman advertises plants of this species for sale. The sterile, flowered variety, the "snow-ball tree," is cultivated for ornament. The closely-related, few-flowered cranberry tree (*Viburnum pauciflorum*) occurs sparingly in the Adirondack region. It is more northern in its range and bears smaller clusters of fruit than the preceding, but its fruit, which is similar in color, is thought by some to be better in flavor.

The sheep berry (*Viburnum Lentago*) called also nanny berry and sweet virburnum, has bluish-black, oval fruit which is sweet and eatable when fully ripe. The same is true of the closely-related black haw (*Viburnum prunifolium*), which is found in the southern part of the State. The hobble bush (*Viburnum lantanoides*) is common in the forests of our mountain districts but does not thrive in cleared places. Its fruit is nearly globular and black when fully ripe. Professor Gray, who is generally accurate in his descriptions, describes this fruit as "coral red, turning crimson," and says its fruit is "not eatable." In my wanderings in the woods I have frequently eaten it and found it sweet and agreeable. This is not the case when it is red or crimson; but then it is not fully ripe. The peculiar habits of this plant would probably render unsuccessful any attempts to domesticate it.

The common elder (*Sambucus Canadensis*) produces broad, flat clusters of berries which are small and nearly black when ripe. These are sometimes used in making wine and pies, but my efforts to eat them fresh from the bushes were unsatisfactory and I hesitate to class them as edible fruit. The partridge berry (*Mitchella repens*) is a small trailing vine which bears bright red berries, a kind of twin fruit, about the size of wintergreen berries. They are sometimes eaten by school children, but they are insipid, dry and very coarsely seeded and scarcely to be classed as edible.

The Heath family affords us several small but excellent fruits and, like the Rose family, it also contains many ornamental shrubs which are cultivated for the sake of their flowers. Both families include plants so diverse in character that systematists have divided them into sub-families or sub-orders. In the Heath family the edible fruits be-

long chiefly to two genera, *Gaylussacia* and *Vaccinium*, in which the calyx, or cup of the flower is adherent to the ovary and forms with it a part of the fruit, just as it does in the apple, pear, quince and June berry. We therefore find the fruit in all these cases crowned with the persistent lobes of the calyx. But it is a little remarkable that, while many members of the Rose family are cultivated for their fruit, only one of the Heath family is thus honored, and its cultivation is of peculiar character and of comparatively recent date. Indeed, it has been claimed by some that the edible, fruited plants of this family are impatient of cultivation, and, like some wild animals, are so thoroughly wild that they resist all attempts to domesticate them. I am not disposed to agree to such a claim, but believe that these plants, with wise and judicious treatment, can be brought under cultivation and control, and be made to yield much larger and better crops of fruit than they do in the wild state. Our huckleberries were formerly classed with the blueberries, which they closely resemble in habit and general character, but they differ from them in the inner structure of the fruit and in the resinous-dotted foliage. For these reasons they have been placed in a separate genus.

The dangle berry, or blue tangles (*Gaylussacia frondosa*) is found on Long Island and in some of the southern counties of the State, rarely in the western part. It is a shrub, three to six feet high, has the leaves minutely dotted on the under surface, and bears loose clusters of blue berries about the size of large peas. It is scarcely abundant enough in our State to be of much economic importance.

The huckleberry, or black huckleberry (*Gaylussacia resinosa*) is a smaller shrub, commonly about two feet high. Its leaves are glandular-dotted on both sides and its fruit is black. It is much more abundant than the preceding species and is found in nearly all parts of the State. It is not very particular about its place of growth, occurring in thin woods and in cleared places, growing on mountain tops and on sandy plains, rejoicing alike in wet or swampy places, in shaded ravines or in open, rocky places. It enlivens many waste districts and renders useful and productive much land that without it would be almost valueless. Though this fruit is more dry and seedy than the blueberries, it nevertheless is in good demand and finds a ready sale at fair prices in our markets, the entire supply of which, so far as I am aware, comes from the wild plants. It varies somewhat in shape, being either globose or oval. Its color is sometimes dull black, sometimes shining black, and in rare instances it is said to be whitish. This tendency in the fruit to vary indicates a susceptibility to im-

provement under cultivation, and the ability of the plant to adapt itself to a variety of soil and location seems to indicate the feasibility of its cultivation. Yet, so far as I am aware, no persistent attempts have been made to cultivate it. Farmers who have it growing in their pastures or woodlands would do well to experiment a little with it and see what effect care and culture may have upon it. They might at least see what a little judicious pruning and feeding will do, without transplanting it.

The genus *Vaccinium* is represented in New York by nine species, two of which are cranberries and seven are blueberries, bilberries and deer berries. Four species of blueberries contribute to supply our markets with this excellent fruit. These berries are about the size of peas and are all so much alike in every respect that no effort is made by pickers or dealers to keep the different species separate. Nor is it necessary, for not many purchasers can tell whether one kind or four kinds fill the basket they buy. The fruit is excellent for eating fresh upon the table or for making pies and puddings. It is easily preserved in glass jars for winter use and retains its flavor well. Its seeds are so small that they occasion no inconvenience. The berries are juicy and, when fully ripe, just acid enough to be agreeable to most people. We have scarcely learned yet to estimate them at their true value. Any efforts that may have been made to cultivate these fruits have not apparently been sufficiently successful to make their cultivation popular or general. And yet we find in our gardens other fruits far less desirable and much less worthy of cultivation than the blueberries. Our markets are at present fairly well supplied with the product of the wild plants. But with an ever-increasing demand and with the diminished supply that must follow the draining of our swamps and the reclaiming of our wild lands it is easy to see that this supply cannot always last. The time cannot be far distant when we must either produce these berries in our fields and gardens or do without them.

The high blueberry (*Vaccinium corymbosum*) is our largest growing species. It is locally known as swamp blueberry and high bush huckleberry. It grows in clumps, or clusters, of a few individuals and is generally four to six feet high. It grows in swamps, about the margins of lakes, along streams, or even on uplands in cool, hilly districts. It has one advantage over the other species. The picker can stand erect while gathering the fruit. Full grown species have been successfully transplanted by removing a whole clump together early in the spring before the frost had left the ground, so that a large mass of the soil in which they grew could be removed with them while

adhering to the roots. The species has several varieties, one of the most notable of which has the berries shining black without any bloom. As in the other species, they grow more or less in clusters and when well ripened can be gathered rapidly by an expert picker. The low blueberry (*Vaccinium vaccilans*) is generally one and a half to two feet high. It often grows freely, even in poor sandy soil, and is generally covered with a profusion of flowers before the leaves are fully developed. It may be distinguished from the other low-growing species by its leaves, which are destitute of hairs, pale on the lower surface, and entire on the margin. The fruit is dark blue, but there is also a variety of it in which the fruit is shining black. The commendable character of this species is its ability to thrive and produce fruit on poor sandy soil.

The Canada blueberry (*Vaccinium Canadense*) is from one to two feet high, and usually grows in patches of greater or less extent. It is distinguished from the other species by its soft, downy or pubescent young branches, and by its leaves, which are also downy beneath and entire on the margin. The species is northern in its range and is especially abundant in the Adirondack region. It occurs in the eastern part of Rensselaer county, but I have not seen it south of Albany. It is rare in the western part of the State. Its productiveness is something wonderful, the fruit being so crowded and so abundant as to give its color to the patches, when seen from a little distance. When fully ripe it may be picked by the handful. In some of the northern counties people go long distances to gather this fruit. It is valuable and merits more attention than it has received. The plant is especially adopted to cool climates and is very productive, even on poor soil. I can easily imagine that, in future years, when this plant shall have become domesticated and its fruit enlarged by cultivation, large tracts of land in the Adirondack region, which cannot profitably be devoted to other crops, will be employed in the production of Canada blueberries and in this way will become valuable and remunerative.

The dwarf blueberry (*Vaccinium Pennsylvanicum*) closely resembles the preceding species, but may be distinguished by its glabrous branchlets and by its leaves, which are minutely notched, or serrulated on the margin. Its fruit ripens a little earlier than that of the other species and, should the time ever come when these plants shall be brought into general cultivation, nurserymen will probably seek their earliest varieties in this species. It grows freely upon nearly all kinds of soil, no soil being too poor to sustain it. It is found in marshes, in thin woods, in open country, on hillsides and mountain summits. It

grows in sandy, gravelly or rocky soil and even in crevices in rocks. It occurs in all parts of the State. Certainly such a plant ought to be capable of cultivation. Two varieties are worthy of mention. One occurs on the Shawangunk Mountains and possibly on the Highlands, and has its foliage of a glaucous, or pale green hue. Its berries are either globose or oval and blue or black. It is not mentioned in the botanies. The other is a dwarf, narrow-leaved form, designated as variety *angustifolium*. In the flora of North America it is credited to Labrador, Hudson's Bay, Newfoundland and the alpine regions of the White Mountains of New Hampshire; but it also occurs on the high peaks of the Adirondacks and on Sam's Point in our own State. In the latter locality it was found in fruit, though but three or four inches high.

The tufted blueberry (*Vaccinium cæspitosum*) is a small species scarcely more than six to ten inches high. It is northern in its range and was never credited to this State till its occurrence here was made known by the writer. It is found sparingly on the summit of Mount Marcy and also on Mount Whiteface. Its berries are about the size of other blueberries and are very good to eat, but the plants are so rare and so local and so partial to such cold, bleak localities that they can scarcely be considered of much economic importance. Should a summer boarding-house ever be built on any of the high peaks of the Adirondacks this blueberry might be available as a useful plant for a sub-alpine garden.

The bilberry (*Vaccinium uliginosum*) is a much more abundant inhabitant of the higher Adirondack peaks and grows to a somewhat larger size than the tufted blueberry. Its fruit, though edible, is scarcely as desirable as the fruit of our other species and is more scattered in its mode of growth. Partridges, or ruffed grouse are sometimes seen in these elevated localities, whither they are attracted, apparently, by their fondness for these berries. The species extends northward in its range to the arctic regions and westward to Oregon and Alaska. The deerberry, or squaw huckleberry (*Vaccinium stamineum*), is not uncommon in many parts of the State. It is generally about two feet high and, unlike all the preceding species, its mode of growth is single, or solitary, not in clumps or patches, and its fruit is neither blue nor black, but generally a whitish-green or faintly yellowish-green, though it is sometimes tinged with purple or purplish-brown. The fruit is generally abundant and ordinarily is not regarded as edible. Its flavor has been described as mawkish, bitter, bitterish and astringent, but Dr. Torrey says that it is not unpleasant

when fully ripe. Samples of the berries from the southern part of the State were once received at the State Herbarium with the remark that the people in that locality called them "high cranberries" and gathered them for preserves. It is not at all improbable that when well ripened they may make good jelly or preserves, even if the uncooked fruit is scarcely agreeable. It is quite possible that by cultivation the flavor of the fruit may be improved, and I suspect from its habit that it is a shrub that will easily submit to cultivation.

New York has two species of cranberry. Both species inhabit cool, sphagnous marshes, wet bogs and the summits of high mountains. Both have very slender prostrate or trailing stems from which spring upright, leafy, fruiting branches a few inches high. The large or common cranberry (*Vaccinium macrocarpon*) is more abundant and more valuable than the other, though Dr. Torrey remarks that the small cranberry is preferred for tarts. Its leaves are larger, more blunt and less revolute on the margin than those of the small cranberry, its flowers and fruit are lateral on the branches, or soon become so by prolongation of the branch. It has somewhat recently been brought under cultivation and now gives value to large areas of boggy, marshy land that formerly was considered almost worthless. By reason of the lateness and firmness of the fruit it can be safely shipped to market in boxes and barrels. Already two or three varieties, based on difference in the shape of the fruit, are advertised by nurserymen, thus showing very early the tendency to the development of cultivated varieties. The small cranberry (*Vaccinium oxycoccus*) has the flowers and fruit terminal on the branches, is smaller in all its parts and its fruit is often, though not always, spotted. In both species the leaves are evergreen, the fruit very sour, firm and late in ripening.

The well-known wintergreen (*Gaultheria procumbens*) whose beautiful, bright red berries are often seen in spring time upon the stands of fruit dealers, is another interesting member of the Heath family. The plant is a small one, whose creeping, subterranean stems bear erect, fruiting branches two or three inches high. These bear a tuft of thick evergreen leaves at the top, which have a pleasant, spicy flavor and are sometimes eaten when young. The fruit is developed the same year as the branch that bears it, but it persists through the winter and is in excellent condition in spring or early summer. It is composed largely of the thickened, fleshy calyx which supports and surrounds the ovary. The fruit is rather dry, but of an agreeable, spicy flavor and, if we may judge by the number of common and local

names that have been applied to this plant, it must have been very popular years ago. Rafinesque gives a list of fifteen names that had been applied to it.

The persimmon (*Diospyros Virginiana*) is a small tree bearing a globose, seedy fruit about an inch in diameter and yellow or orange colored when ripe. This is harsh and unpleasant to the taste till fully ripe, or until it has been subjected to the action of frost. The tree barely enters our limits on the south, occurring on Staten Island and possibly in Westchester county. Rafinesque pronounces it valuable and worthy of cultivation, but it does not appear to have acquired popularity as a fruit tree.

In the Nightshade family, which has given us such valuable esculents as the potato and tomato, we have two species whose fruits are sometimes eaten. The common or black nightshade (*Solanum nigrum*) is an annual which grows in shaded grounds, fields or waste places, and bears black berries about the size of peas. These were formerly reputed poisonous, but Professor Bessey says that in the Mississippi valley people use them for making pies. Probably if they really have any poisonous property it is expelled by cooking. The plant was formerly regarded as an introduced species, but it is now considered indigenous. The ground-cherry (*Physalis viscosa*) is a low perennial herb which bears globose, yellowish or reddish, viscid fruit about the size of a cherry. Each fruit is concealed in a large membranous, inflated calyx, which enlarges greatly after flowering. The fruit is fragrant, slightly acid, but not unpleasant to the taste. Two other species (*Physalis Alkekengi* and *Physalis Peruviana*) are sometimes cultivated under the name "strawberry tomato," and these occasionally spring up spontaneously in gardens and waste places.

The nettle tree (*Ceilts occidentalis*), which is also called hackberry and sugar berry, is related to the elms, but it bears a berry-like fruit about the size of a pea. This is purplish red when ripe, and though its pulp is thin it is juicy, sweet and edible. In some parts of the State this tree is quite scarce, but it is not rare in the lower part of the valley of the Hudson river.

The red mulberry (*Morus rubra*) is a shrub or small tree related botanically to the famous tropical bread-fruit tree. Its flowers are very small and aggregated in a short cylindrical spike which becomes fleshy and juicy in fruit, resembling somewhat a blackberry in shape and size, but it is of a dark purplish color when ripe. It is sweetish and edible and was long ago employed by the Indians as food. The tree is now rather scarce within our limits.

Of nut-bearing trees and shrubs we have ten species with edible fruits. These are so well known that I will merely mention their names. There are two walnuts, the black walnut (*Juglans nigra*) and the butternut (*Juglans cinerea*); four hickories, the common shagbark hickory (*Carya alba*), the western shagbark hickory (*Carya sulcata*), found only in the western part of the State, the small-fruited hickory (*Carya microcarpa*), found only in the southern part of the State, and the mocker nut, or white-heart hickory (*Carya tomentosa*), found chiefly in the southern part of the State; one chestnut (*Castanea vesca*, var. *Americana*); one beechnut (*Fagus ferruginea*) and two hazelnuts, the wild hazelnut (*Corylus Americana*) and the beaked hazelnut (*Corylus rostrata*).

The monocotyledonous, or endogenous plants, from which we derive all our valuable cereals, except buckwheat, afford us almost no native species with edible fruit. The seeds of Indian rice (*Zizania aquatica*) are said to have been a favorite article of food with the Indians, and the berries of Solomon's seal (*Polygonatum biflora* and *Polygonatum giganteum*) are said to have been eaten by them, but I am not aware that the whites have ever followed their example in this respect. The fruit of the birthroot (*Trillium erectum*) is sometimes eaten, but, on account of its scarcity and unattractive character, it is hardly worthy of a place among our edible fruits. The cultivated cereals sometimes spring up by roadsides or in waste places, but they do not become permanently established. In this country at least they are as much dependent upon man for their continued existence as man is upon them for his subsistence.

In conclusion, we find that New York has at least fifty-six species of indigenous plants which bear edible fruit. Of these, fifteen are already cultivated and offered for sale by nurserymen. At least seven or eight more are, from the excellency or promising character of their fruits, worthy of cultivation. Adding to the fifty-six species the ten that bear edible nuts and the nine introduced species that are cultivated for their fruit, but that sometimes grow wild, and we have seventy-five species which bear edible wild fruits within the limits of the State. Probably few, if any, States can make a better showing in this respect. Then, when we consider the almost innumerable varieties that may be developed from these by cultivation, crossing and selection, we may begin to realize with what a lavish hand nature dispenses her gifts, and from what an abundant storehouse we are permitted to draw.

OUR RETROSPECT.

By LEONARD KIP, President of the Institute.

[Read before the Albany Institute, May 21, 1889.]

It would seem as though it should be a very easy thing for men to unite in the formation of societies for investigation and mutual improvement,— a thing so natural, indeed, as almost to be forced upon them by the conditions of their existence. Men are gregarious; and when not living in a state of chronic distrust of each other are somewhat socially inclined; a little communicative, perhaps, by nature, and very much disposed to rehearse to one another not only their own actions and impressions, but also whatever they may have chanced to discover concerning the actions and impressions of others. How natural, then, one would think, that they should take pleasure not only in disseminating the results of their investigations concerning their fellow men, but also of their researches into the inanimate world around them; each one doing his proper part not merely in examining the processes of nature as spread out on every side, but also in bringing himself into fraternal association with other men, for the interchange of similar observation and discovery.

And yet the contrary seems generally to have been the rule. Whatever the reason for it, it certainly appears that it must have been necessary for the world to develop a very high civilization before it could reach that plane of mutual interest, wherein personal distrust could be cast aside, and the benefit of a fraternal interchange of knowledge secured. For through all the pages of past history we can read little more than the constant avoidance of man by man regarding any thing that may relate to general improvement; nor, through the records of long centuries, can we discern any thing approximating to our modern fashion of assembling ourselves for interchange of thought.

Looking back at our very earliest records of any description, we examine the Egypt of four thousand years ago, during that most promising state of its civilization which existed just previous to the construction of the pyramids. What light do we there find? We cannot accurately tell; though perhaps some day, when the science of deciphering hieroglyphics shall have been further advanced, we may

learn more. We know, of course, that the Egyptians were wonderful in their architecture, and we have been educated to believe that they had certain very correct conceptions in astronomy ; but we cannot now definitely determine how far or in what manner any popular study of the sciences may have been fostered. As for even their astronomical knowledge, perhaps the beginning if not the very ending of it may have come, as did the astronomy of the Chaldeans, mainly through lonely shepherd observations from the star-lit plains, whereby at last all men came to know what other and more reflective men had calculated from the first, and all further progress been arrested as soon as enough had been learned to help locate the angles of a royal tomb or determine the true direction of an avenue of sphynxes ; and perhaps in like manner the study of all sciences was never advanced beyond a few leading principles. If Egypt in its palmy days ever enjoyed the advantages of any co-operative scientific method, its results must have perished with the nation, leaving no sign.

We come down, for further examination of the question, to the best known of early written records,—the books of the Old Testament. Here, too, we find little to encourage us. These books are grand in conception and purpose, poetical often in diction, to be read for instruction and example, to be cherished as the outpouring of a devotional spirit, which, if it had ever at any previous time existed in an equal degree, had had no similar depth of expression ; but still, in many respects, are confined within narrow limits of thought and unobservant of any thing relating to the natural sciences or the study of them. It is to be presumed, of course, that works written as history, or for purposes of praise, prophecy or the inculcation of the moral law should not be expected to treat about scientific problems; still it seems scarcely possible that writings upon varied subjects, by different authors and extending over many centuries should not, by suggestion, throw out some intimations about the conditions of social culture attending their several epochs. Yet here we find scarcely any allusion at all to the wonders of nature spread so freely around and so earnestly seeming to demand investigation, no curiosity about races not far distant and many of them living under systems of philosophy, codes and traditions well worthy of bein studied, scarcely a thought even about the stars shining down with unceasing invitation to have the laws of their being and the methods of their progress through space examined. A calm, uninvestigating literature, marked with more than ordinary exclusiveness and narrowness of regard concerning physical matters, and certainly not suggestive of a generous desire in men of any class or nationality to enliven their period by

association for mutual culture or for any kind of progress tending toward the better welfare and education of the people. It may seem, at first sight, that evidence to the contrary might be adduced from the utterances of Job and his three so-called friends. That these men must have been animated with a spirit of keen enquiry might well be judged from their conversation, which shows not only a cultivation perhaps superior to their age, but an earnest appreciation of all fields of knowledge, not to be controlled or kept in check, but compelling them at almost every sentence to turn from that stern purpose of recrimination which seems to have brought them together, and indulge themselves in an abundant variety of illustration and comparison from nature's works. Arcturus, the Pleiades and the other wonders of the firmament, behemoth, leviathan and the secrets of the great deep, here and there a wandering into dreamland and the habitation of spirits, with some faint dawning of the mysteries of psychology,— as we search through the pages of that most wonderful poem of all ages and languages, what department of sidereal or terrestrial science do we find untouched by these four men in their seeming manifestation of overflowing love of knowledge? But if we examine closely, we see that even in these utterances there is very little real spirit of enquiry, or at least little perception that enquiry could be of any avail. "Who can measure the depths thereof?" That is the prevailing and hopeless tone of the whole poem: not a desire for investigation, but rather an apathetic condition of wonderment about things that it seemed to those men could never be satisfactorily explained at all.

And so the world seems to have run on, with little care for any thing except the gratification of physical wants and sordid ambitions, and with only an occasional thought of response to the tempting of nature's marvels. I do not wish to be understood as implying that the history of mankind shows no regard or capacity for knowledge or progression. There have been bright spots everywhere and in the annals of all nations that have had sufficient richness of language to be capable of a literature, and there have been many men of genius who have adorned those languages and left us imperishable treasures of thought. But the fact remains that where there have appeared minds in any way gifted for investigation and in sufficient numbers to invite co-operation, it seems always to have been ordered for selfish or superstitious purposes, with timid conception of the enlarged results that might have been reached through generous method, and altogether with very faint and desultory groping within narrow limits. There were the schools of Greece, for instance, celebrated in their day as the condensation of the intellects of gifted men and which have left us a

noble inheritance in art and literature. We must not regard these slightingly; we can only speak lovingly about them, for in almost every department we are enjoying the results of their teaching. And yet it seems to me a matter of little question that these results came mainly from some instinctive impulse of the whole people, pressing them forward toward their realizations of excellence in taste and art, and were mostly attained through individual genius; that there was little spirit of actual organization for urging on the good work in behalf of future generations; and that, when the æsthetic longing of the nation for beauty had at last been satisfied, there was only a feeble impulse left in the life of the people toward any co-operation of talent for purposes of merely inartistic and useful progression. And it further seems to me that after the glories of the past had been duly chronicled, even in their literature there was too large a leaven of the teachings of certain captious philosophers of the day, calling themselves the leaders of thought, but by whom nothing other than useless abstractions seemed ever taught; drawing after them through the sacred groves their trains of pupils all so weak in worship of their chiefs as to give little heed to any promptings toward independent theory; neglecting physical science for mystical disputations about the unreal; inventing philosophies which with coming centuries were superseded by other philosophies having foundations no better laid, but which for the time were made more attractive with the glitter of novelty, and leaving a record of argumentation not more solid and improving than the silly speculations of the schoolmen of the middle ages. Passing onward, we come to the more practical talent of the Pontifices under the Roman Empire, entrusted by the government with the care of the calendar and the due announcement of the feasts and fasts and, perhaps, with the supervision of the public works. With them, as an associate body, must have been collected much of the advanced science of the period. Yet what do we read about them which can encourage the supposition that they performed their duties in any other than a perfunctory manner, stolidly using their advantages without any attempt to improve upon them, employing in their duties any other than that superficial knowledge that might have come down to them through the investigations of former periods, and caring little about increasing the wisdom of the world by original research or invention, so long as they could feel assured that the information already stored up would serve the purpose of their generation? There was the later association of the Master Builders of the Middle Ages, united together by a bond of secret fellowship, supposed by many to have been the originators of

the present order of Freemasonry, men who through centuries of political turmoil and confusion had somehow managed to preserve many valuable secrets of their trade, and, when the favorable occasion came, brought them cautiously forth in their decoration of the renaissant Europe with palaces and cathedrals. But what else were these than men with selfish aims, so far from wishing to spread abroad their art for the general good as to have invented a most complete system of trade co-operation, expressly designed to hide their treasure of science from the outer world, even if it were to perish with them? Here and there stood a great university, founded by royal grant and in some measure supported by royal patronage, boasting of great libraries and of its thousands of students; and possibly these institutions in their results may have been in many respects an advance upon any thing that had gone before. But, all the same, how thoroughly were they not given over to olden courses of superstition, heaping up useless rubbish under the name of learning, not daring to pass out of their beaten track lest some evil might befall them in the loss of charter or privilege, in many ways fettered by royal command and political necessity,— as when the University of Paris assumed the office of the inquisition in the trial of witches and heretics,— and, generally, having little more than a distant and ceremonious association with each other, lest any one of them, feeling jealously disposed, might steal another's methods?

Everywhere, in fact, the same unvarying record. A dull uniformity of stolid contentment with the knowledge already attained; or, if an attempt toward better progression was made, its organization hampered at every step. Perhaps no lack, at times, of individual originality of thought, yet always an absence of any generous conception of what the world really required, a blind devotion to superstitious usages, entangling alliances with crude tradition and supernatural absurdities, a foolish acceptation of misty abstractions, a pandering to the false sciences of horoscopes, birth predictions and alchemies. How could it have happened, we may rightfully ask, that almost within the memory of living generations and amid the gleaming of a better intelligence which here and there and in all ages must have been shining more or less brightly, the time seems not to have come when science could be cultivated for the sake of science itself, and men have learned to meet together without expectation of profit or distinction and endeavor carefully to gather up every fragment of new information, not only in literature and art but also in matters relating to the most ordinary and unornamental purposes of life, and store them reverently away in the hope that, though of no use now, they might

become so centuries hence; and so in that generous spirit of progress the world have learned to throw open the doors of its treasure houses of knowledge and let their light and intelligence stream forth freely for every class and people?

In his "Study of Sociology" Herbert Spencer writes at much length about the many steps generally needed to bring about and perfect what at first sight seems a very ordinary and comprehensible result; so simple in its origination and application, and so necessary, withal, to the progress and happiness of the world, that we feel perplexed to understand how purposes apparently so easy of attainment had not been reached centuries before, not merely through the ready skill of any one among thousands of intelligent workers, but also through the co-operative adoption of it by an appreciative community. He instances a copy of the London *Times*. Surely this should have been a thing easy of production even from early ages, if people had been so inclined. What so ready of conception as the fact that a few movable blocks of wood or metal, blackened and pressed upon some white yielding substance, should leave their traces, to be read by any one who knows how to read at all! How natural, too, that with this easy method of conveying intelligence, the world should hasten to gather together all current information at stated times, and bring it to one center of dissemination! And why, therefore, should there not have been a London *Times* from time immemorial? But at the date of the origin of printing, it seems to have needed more than ordinary brain power even to conceive of the plain fact that types could be so constructed and impressed, much more to contemplate the possibility of inventing the soft white material which we call paper. And in the story of the progression of these conceptions to maturity from their earliest stage of experiment, there is no one who can now place in due order and sequence the mechanical and chemical applications which necessarily introduced further improvements, one upon the other, before the manufacture of type and paper even in their most simple state became a practical possibility. And there is the printing press itself, gradually evolved from a slow and awkward hand-machine into a wonder of complex machinery, and even in that shape useless unless aided by the still more wonderful application of steam power; what thousands of inventive minds must have worn themselves out in toil and study before those machines could exist in their present perfection! And there must be the education to permit of the collection and record of ideas for dissemination, and the will to make this dissemination for the world's benefit; else would those machines, however grandly perfected, stand idle and useless. And there must be the

community's consent to call for the production of those ideas, and there must be the legal permission to present them, as long as they are proper and innocent, without danger of tyrannous repression. In fact, what departments in science, education, jurisprudence, invention and industry can be left out of consideration if a copy of the London *Times* is to be produced?

In like manner let us study the difficulties surrounding the growth of associations like our own. It seems very easy from the first, does it not? Only a dozen or two of quiet gentlemen with scientific or literary affinities, with leisure to cultivate them, and who could entertain the idea — and what idea more easily apprehended? — of meeting occasionally in some comfortable room, and interchanging their views about whatever may be novel or interesting in art or science. And having done so much for their own pleasure, how easy to supply the world at large with the results of their labors, so that all other men may be equally benefited! Why, this is a thing which should almost come about of itself, without care or forethought. There should certainly have been educational and scientific associations similar to our own many centuries ago.

And yet, in the very beginning must come the difficulty of supplying these few learned and earnest men with the basis of any such association. Even in our own day of universal instruction, a great deal of sifting down must be exercised in collecting such material. Among the large number of persons now among us who have attained the ordinary education of the period, there may be few who take sufficient interest in it to care about increasing their store of knowledge simply for knowledge's sake. Most all will remain content with what to them is merely necessary for the practical working of life in their business complications. Of these there will be fewer who are fitted by nature for independent investigation, with any accompanying disposition logically to correct the errors of the past and place their education upon a more expansive as well as trustworthy foundation. And among these, there may be very few indeed who will take sufficient interest in their work to feel stimulated to spread abroad their labors and discoveries for the benefit of others. If this is so now, how much more difficult it would have been to gather even a less number of such persons in those olden days when the most simple education of the masses was not considered, and when even the art of writing was mainly confined to monasteries and the clerkly departments of royal courts.

But supposing that at last these men should be successfully collected, it would be found that they must not only be scholarly inclined, but

should have the logical mind so seldom anywhere found, fitting them to investigate for themselves, to throw aside ridiculous and unsubstantial theories, and consequently to lay out a broad and independent path for new truths. The difficulty surrounding this necessity will be seen when we read in old treatises, mediæval as well as ancient, the queer remedies given for diseases, surpassing belief, and the quaint superstitions about animal charms and transformations, not only credited at the time so implicity as to admit of no questioning, but coming down as a part of the accepted education of the day, until we see that even such men as Bacon were not entirely divested of their influence. And these men should have power to make their investigations freely, and more especially without interruption by the State, which once was accustomed to look upon all knowledge with a jealous eye, as something which was unnecessary for any except a very few, and might easily lead to corrupting license, productive of dangerous theories and thereby antagonistic to the peace of nations, as maintained through an unquestioning adhesion to the doctrine of the divine right of kings. And again, even if through some good fortune evil opposition should be restrained, they should have either the sagacity to conciliate or the power to defy the holy offices of the Church, always so alert to detect heresy, constantly so ready to interpret as heresy the faintest whisperings of any new scientific truth, and never in the least scrupulous about crushing the new truth at any extremity of torture to the teacher or of loss to the community. That bar to knowledge and progress was not lightly to be disregarded in the day when Galileo could be summoned, with threat of rack and thumbscrew, to recant; and there must have been found few, if any, who could stand up against such an unpitying power. Galileo probably never uttered his re-attestation of the truth "and yet it moves," as he went forth from the chamber of the inquisition; but, if so, it must have been as a whisper into a friendly ear, for we nowhere read that he dared publish his protest in a volume of transactions. And again, even if through some good fortune these men could surmount all these obstacles, they must learn to live under cruel suspicion and watchful scrutiny, without enjoying the reward of public approbation, their brighest discoveries being misinterpreted as magic or alchemy,— obliged to remain content, in fact, with laboring simply for their own self-approbation. Even in these days it is difficult successfully to write a treatise, however fully it may embody its author's views and speculations and however earnestly it may cry out for production, if when completed it will receive no public approval, and were to be at once destroyed, or if — as would be almost as disastrous — it were destined to be hidden away in some

musty receptacle, awaiting the distant chance of being brought to light only in some far-off century when men might become wiser and better disposed to examine into the value of past researches. How much more difficult, then, would scientific investigation have proved itself in the olden centuries, when the most ardent student must have felt that he was looked upon not only slightingly as a mere useless theorizer, but even with contempt, as one who was cravenly avoiding the more honorable profession of arms,—perhaps with something of that sneering pity with which strong natures of that period must have regarded the quiet labor of copyist monks!

And still again, let us suppose that in course of time these obstacles might become decreased or altogether swept aside, the difficulty would not be entirely out of the way. Currents of human thought move slowly and cannot easily be turned from their accustomed channel, and it must take men a long time to realize that they can at last freely discuss some subjects hitherto forbidden. And having finally learned this, it must take even longer to comprehend that certain disputations which were once so criminal as to demand the rack and faggot for punishment can be indulged in without impropriety, even though with the full knowledge and consent of the law. We see this in the fact that even now among many men and sects the discussion of scientific truths which may be supposed to conflict with Scripture is frowned upon; and we know that in portions of Europe from which the veil of ignorance has been yet only slightly lifted, medical treatment of the insane is discountenanced as opposed to an orthodox belief in demoniacal possession, and in times of pestilence precautionary measures of drainage and cleanliness are neglected as of little value in comparison with the exhibition of relics or with pilgrimages to holy shrines. And beyond all this, generations must pass away before the scholar with a scientific or philosophical bent of mind can feel assured that the public countenance has at last been turned approvingly upon him, so that he can labor with some hope of sympathy, or at least without being looked upon ascant and doubtingly, as one who is spending his life in a sort of useless craze and might better be engaged in some more reputable and manly occupation. And until this change of sentiment comes about, there can be few accessions to the ranks of investigating men, and only in large centers of population can many of them meet together for discussion; and hence there can be little profitable consultation among them, and centuries may pass away during which in their isolation they must pray in vain for the dawn of that more enlightened day in which their labors will at last be held in proper considera-

tion, and themselves given that meed of honor to which they feel so justly entitled.

These, therefore, are a few of the principal essentials for the earlier formation of societies like our own: the supply of members looking to something beyond the ordinary ambitions of the day, and disposed to give their time and energies for an unappreciated cause, perfect civil and religious liberty, so that their investigations may not be thwarted or crushed out, and a proper countenance from the community, so that these investigations, even if allowed by authority, may not be lost for lack of encouragement and co-operation. And as it could scarcely be expected that at an early period there should be any self-constituted body of men strong enough successfully to surmount all obstacles, it must be conceded, I think, that such associations could not have existed in necessary freedom and fellowship until within the last two or three centuries, perhaps not with perfect completeness until the beginning of this century; and then only as the result of an evolution in political and ecclesiastical authority, in educational privilege and in social condition even more gradual in its many thousand minute changes than the evolution through scarcely perceptible processes that at last led to the possibility of a London *Times*.

It would be a pleasant feature in the world's history, if it had always been otherwise. It would become a very interesting task to examine the transactions of some society that had existed in the fullness of freedom and co-operation for many centuries, publishing its researches every year, until the aggregate of its labors amounted to many hundred volumes. It would be a captivating study to run through the series of its productions from the very beginning, noting how each volume marked a slight progression in the world of thought and discovery, and how, from the first, light had been thrown upon olden superstitions and stern logic applied to foolish fallacies; so that, at the end, scientific truths would be found to have banished mediæval fancies, and the bringing together of volumes far apart in their sequence, however little each might differ from its predecessor, would show a marked progress in any interval of a few score years. That this cannot be done, however, is somewhat to the benefit and credit of the Albany Institute. It enables it to stand co-eval and co-equal with other societies of its kind. First as the Society for the Promotion of Agriculture, Arts and Manufacture, then as the Society for the Promotion of Useful Arts, and after that as the Albany Lyceum of Natural History, the whole subsequently coalescing into the Albany Institute, practically the same association throughout, with merely a change of name as occasion dictated the need of it, the members of one society merg-

ing into and so constituting the other, the constitution and routine almost the same in each,— we can truthfully look upon ourselves as one continuous body, extending back for nearly a century, reaching very closely to the earliest period when the progress of thought began to encourage such efforts as ours, the cotemporary of any other long-established society in the country, and perhaps even older than any other, and known in the United States and Europe as an aggregation which, without wealth or government patronage, has grown up with respect and authority. This is the proud position in which the long delay in free thought and action has placed us, giving us an opportunity to make our retrospect with satisfaction, as conscious of an honorable precedence properly bestowed upon us and of a reputation which we cannot but believe has been well sustained.

Looking back, we find our first volume bears date of 1830. The number of officers was less than now, the organization of the society having since been changed as it became desirable to enlarge its scope. For President we have Stephen Van Rensselaer, for Vice Presidents Simeon DeWitt and T. Romeyn Beck, for Treasurer William Mayell. Peter Gansevoort and W. Henry Webster, were Corresponding Secretaries and Henry W. Snyder and Richard V. DeWitt Recording Secretaries. Then we had for Librarian Joseph Henry, while the Curators are Lewis C. Beck, W. Henry Webster, George W. Clinton, Richard V. DeWitt and William Cooper. All these men have long passed away from us, and it is probable that only the older members of the Institute have any personal recollection of any of them. The late Vice Chancellor Clinton was the last to leave us, and beyond him there are some of us who remember Gansevoort and DeWitt — possibly these are all. Looking at the table of contents we see that the contributions were of a high order and principally by members who have left their works well impressed upon their generation, so that it may be said that our Institute sprang into being, full fledged. Dr. Lewis C. Beck contributes two papers, one on the Geographical Botany of the United States and one upon the Climate of the Mississippi Valley; and T. Romeyn Beck is not behind him, coming with Notes upon the Peculiar Vocabulary of the United States and also an Anniversary Address. Joseph Henry contributes a paper upon Modifications of the Electro-Magnetic Apparatus, showing the direction in which his genius was already leading him, and also a Topographical Sketch of the State of New York. Doctor I. Green, a corresponding member, gives four papers of a scientific character, and the names of Simeon DeWitt, Lieut. Ingalls of the United States Army, James Geddes, James O. Moore and Doctor James McNaughton also appear as contributors. Last to be

mentioned in its due order is a discourse delivered at the First Anniversary of the Institute after its incorporation by the Legislature, by Benjamin F. Butler,—distinguished in his day as one of the great lawyers of the State,—at one time partner to President Van Buren, Commissioner to revise our statutes, then Attorney-General of the United States, and for a short period acting Secretary of War. It is a well-written discourse upon the purposes and duties of the Institute and occupies 53 pages, to which is a supplement of 26 pages of closely-printed notes. Whether he delivered the whole paper at one sitting or whether a portion of it was "considered as read," we cannot now tell. But we must remember that those were times in which the world did not hurry as much as now, and in which by practice men gained the happy faculty of sitting patiently beneath preachings of one or two hours' duration; and therefore we may assume that much might be allowed in favor of an orator who offered such an excellent contribution.

I have made this rough digest of the contents of our first volume without any intent to continue it through the subsequent volumes. My object has been simply to show the method of the Institute upon starting on its course of publication,—to let it be seen how heartily members who then and afterward achieved wide reputations entered into the spirit of the undertaking, and to serve as a basis of comparison with subsequent work, so that it can be determined more easily whether we have improved upon or degenerated from the method of our beginning. Therefore we will pass hastily over the succeeding volumes, merely stating that the work seems to have been carried on thenceforward with equal ability, sound treatises being contributed for a while by many of the same men who had appeared in the leading volume, and their places becoming filled, as one by one they passed away, with men of similar culture and scientific acumen. But we must linger a moment over the fourth volume, for this in point of date if not of numbering comes about midway in the series, containing papers contributed from 1858 to 1864. Nearly thirty years therefore were occupied in the production of four volumes,—a point to be considered by such as now chide the delay in our publications and call for a yearly volume, and do not realize as they might, the importance of leisurely discrimination in our offerings to the public.

We find in this volume a very great change; not in the nature or quality of the contributions, which still maintain their high character, but in the membership of the Institute which, as shown in the earliest roll of officers, is very different. Death has been exceedingly busy, and of the former list, but few remain. We have now for President, John V.

L. Pruyn, late Chancellor of the State, and, as the change into departments has meanwhile been made for better facility in work, there are more officers than before. Among them we read still the names of Richard Varick DeWitt and Peter Gansevoort, but all else are changed. Now appear Doctors Mosher, Vanderpoel and Howard Townsend, Professors Hough, James Hall, Amos Dean and C. H. Anthony, the celebrated printer Joel Munsell, Dr. John N. Campbell and Judge Alexander S. Johnson. To many of us the Institute now begins to wear a more familiar aspect, for we have personally known these men, and naturally from that knowledge can better appreciate their work. We can recall how indefatigable they were in pushing on our objects, and can almost see them as they stood at the end of the long table and read their contributions or joined in the discussions which were sure to follow. In our recollection they were all men of mature life, who had made reputations in their several professions and naturally had acquired dignity and repose; but some of them must have been young men when first appointed to office and were well content to occupy medium positions in our government, if thereby they might have the opportunity to assist the Institution with their labors. Thenceforth and for many years those men with scarcely an exception continued to enrich the Transactions with their well-considered papers,—some of them young men, as I have said, or, at the most, not more than middle aged. From these, however, stand out three or four well-loved members, who even then had earned honorable gray hairs and had begun to feel entitled to seek comparative repose, but none the less have always shown themselves alert and active when the interests of the Institute asked their attention. These are Prof. James Hall, best known abroad of all New York State scientific men as a Geologist of high attainment, who has often given prominence and character to our volumes by contributions which no one else could hope to equal in his chosen line of study, and still lives, further to enrich our Transactions; William H. Bogart, the fluent speaker as well as the ardent lover of olden memorials and associations, now no more, but until the last, never failing to visit us whenever he could, and when too feeble for that, still remembering us in his correspondence; Dr. Henry A. Homes, the experienced Librarian, and known also as the gifted student of Arabic lore; and, lastly, Orlando Meads, at one time the oldest of our Institute in membership, our honored President when he died, and who, in an anniversary address, so fully occupied his subject with his correct memory of long-departed members, that no one can attempt to cover a similar ground until succeeding generations shall have relegated to the past the story of later

memberships. These noted friends and members of our society certainly deserve our especial mention.

And now, passing lightly as before over the intervening space, I come to our last volume, the eleventh. Again death has been busy, and the list of officers is now almost entirely changed. Of those who appeared in the beginning of the fourth volume, only one remains alive and he living away from us. And once more we find, mingled with the more mature, young men occupying many of our offices; and we feel pleased to note their readiness to come forward for our welfare, and feel satisfied that when, with advancing years, they shall have gathered professional honors, they will have so schooled their tastes as not to have lost their interest in the Institute. Of the contributors to this volume I must not speak. They are well known to all of us, and since so many of them are now sitting before me, it would be improper not to respect their natural modesty. And yet, as before suggested, I must enter into some short comparison between this last volume and the first, to determine how far we have kept to our original purposes and maintained our reputation ; and in doing so, I must naturally make passing mention of the articles themselves.

There is "Life in the Arctic," by one who has made such enterprises his pursuit for years, and there is a somewhat kindred article upon "The Expedition of the Alert to Hudson's Bay," replete with geographical and ethnological observation. There is a comprehensive study of the question of an "Open Polar Sea ;" and this, to those wishing to review our papers in detail, as one subject suggests another, naturally leads to "The Variation of the Needle and the Location of the Isogonic Lines in Northern New York." Again, and a little suggestive of the others, comes the "Dreamers of the Columbia River Valley in Washington Territory." So much for the geography of our volume. "French Discoveries in New York," "Arendt Van Cuyler, first superintendent of Rensselaerwyck," and "The Correspondence of Governor Tompkins" relate to our local annals ; and in "London Stone" we have a surprisingly minute, careful and exhaustive compilation of many facts and incidents in London history and biography, which, but for the writer of that paper, might have remained altogether unknown to us. "Locutius in Fabrica" treats pleasantly about certain peculiarities in our language ; and "Fertilization of Flowers" and "Chemical Analysis of Potable Waters" need no commendation, for they are the work of authors who are experts in their subjects, and know whereof they speak. "Literary Property and International Copyright" relate to our law, and "Gold, Silver and the Coinage of the Silver Dollar" to our finance ; while "Shakes-

pearian Criticism," "Bibliomania," "Heraldry in England and America," "Greek Theory of the State," and the "Albany Lancaster School" adorn our pages with much profitable thought. Last to be here mentioned but not least, is a well-considered article upon the Albany Institute by one of our then oldest members, perhaps the most distinguished of all in length of public service, and since deceased.

With this short review, you will see that there is little difference between the character of our first and last volumes; except that, with the increase of subjects of interest as the world has grown older, our contributions have become more numerous. As in the first volume, they are principally upon scientific topics or, at least, based upon scientific fact. This is as it should be, for our main object must be the preservation of ideas, and there can be no ideas so worthy of being stored away for the future as those relating to scientific uses. We must remember, as the men who have made our preceding volumes remembered, that we are not a debating society, or a close corporation for mutual improvement forgetful of the outer world, or an association where men meet merely to read well-written essays to each other, caring for nothing beyond the applause which excellence in composition generally insures. We have before us the duty of rescuing from impending forgetfulness whatever is useful in art or science, whether in invention or discovery, and of giving it a permanent home, so that, if the world is not yet ready to receive it, the power to adapt and use it for good will remain whenever the proper time to do so shall come. For this, we have our own district from which to glean; a district not accurately to be bounded, but which may be defined by a radius longer or shorter, as it may reach in either direction until it meets the circumference of other neighboring districts similarly surrounded by kindred associations. Beyond this we are not forbidden to go, for our labors must not too rigidly be circumscribed; but while searching through other lands may be our pleasure and of value, it must be understood that gleaning from our own district is our most immediate duty, as, if we neglect it, there is no other organization to take our place. It is for us for instance to note the local tornado that cuts a path through our forests, with more attention than the earthquake that may swallow up a foreign city, and which will certainly there be described by other associations. And we are especially favored for such a duty from having in our midst most able professors in every department of science; not merely amateurs in the good work, but men of trained talent, recognized by the State and brought here from different quarters, so that the seal of the State's employment and approbation may render those services valid

and unimpeachable. There are, of course, departments of knowledge other than those of science into which we can enquire; but of these there must be much to be said in way of limitation. It should never be forgotten that we are accumulating material for the future, and that whatever can have no value for the future can be looked upon with little favor, in the making up of our records. There are intricate problems in history to be unraveled; and, whenever a statement of well-known events is presented with such comments as will throw new light upon them and give the world even an inkling of original thought, that will surely be acceptable to the Institute. But we can care very little for the pen that superficially transcribes well-known facts from the cyclopædia and simply re-arranges them, however artistically and pleasantly the task may be done. A hitherto unpublished Macaulay essay, brilliant and sparkling, yet provocative of no new suggestion in the way of historic philosophy should have for us less value than the exhumation of a new fossil. The story of travel that simply tells a pleasant sequence of wandering in strange lands must fail to meet our needs; yet if it gives information about hitherto unknown customs among aboriginal tribes, or in any way adds to our geographical knowledge, it must always be welcome. And random comments upon civil or social problems that have already been abundantly discussed in the public journals and with or without debate will always adjust themselves in a few years, can have no cordial reception among us; yet, on the other hand, cannot fail to be welcome if treated with such broad and generous method as to incite new or enlarged reflection. With every question brought before us, there should either be fresh facts in the way of discovery, a disinterment of old facts that have intrinsic value and have only been lost to sight from lack of adequate setting, or new germs of philosophic thought that, properly applied, will give peculiar interest to a re-discussion of the subject. This policy we have so far mainly pursued; and if we would preserve our well-earned reputation among other societies, we must continue to pursue it to the end and not be too hasty in admitting what is crude or commonplace. It were better to occupy another fifty-nine years bringing out eleven additional volumes of Transactions compiled with shrewd discrimination, than to publish a new volume yearly in haste and with superficial material.

This then is our record,— these eleven volumes of Transactions, well selected. I do not think that we need feel dissatisfied with them. If they are not as full as we might wish, our failure is merely one of omission; there is nothing in our record which we would wish to have stricken out. I think we know very well the value of what

we have been doing, and that others know the same. From the British and Kensington Museums, from various societies not only in England but also upon the Continent, from all the prominent associations of our own land year after year comes the request for copies of our Transactions. These societies feel the importance of our contributions, and in making up their libraries they do not call any thing complete that does not contain our volumes. Not that we profess to offer any great and widely-renowned papers. The world may roll around in its course for many more centuries before the Transactions of any society will contain another Novum Organum or Principia. But in our own sphere or district we gather up and put upon record much that would otherwise be forgotten. The description of the skeleton of an extinct species of quadruped, the fossil that supplies a missing link in the history of the evolution of a fish or insect, the course and distance of a more than ordinarily interesting meteor, or the calculation of the orbit of a comet deigning to appear only to our Observatory, —all these we try to place upon our pages, side by side with any other seemingly less important fact or discovery, not knowing how soon the slightest record of its kind may grow into valuable service to the world. We who can appreciate the close connection of the physical sciences know that though our papers may lie upon library shelves unheeded through centuries, until at last they fall to pieces through old age and are lost forever, here and there may be a subject for which the world some time may have need, and which it will exhume from the dust with satisfaction and profit. The chemical discovery which will color a liquid for mere purposes of iridescent beauty may at some future time aid in the clarification of a prism which will unveil the secrets of the sun; and some new application in smelting, designed simply to give strength to a kitchen utensil in a scullion's charge, may hereafter be found available in the casting of guns which will protect our sea-coasts from ravage, or sink a navy of iron clads.

I do not profess the knowledge or skill to show wherein the Transactions of the Institute have been of any immediate use, or have quietly led the way to new discovery. There may be many such instances or they may be very few. But I will mention at least one illustration, as shown lately by Vice-President Colvin in his valuable contribution upon "Coast Defenses," and in which he tells how the great inventor Ericsson credits to a long-forgotten page of the Albany Institute the conception of a turret-armed iron-clad. I cannot do better than quote Mr. Colvin's own words, in which he had admirably condensed the whole matter.

"John Ericsson," he says, "in his account of the origin of the

revolving turreted monitor, expressly disclaims having originated the revolving turret battery, which, on the iron clads of his design, gave such strength to our navy in the last war.

"Ericsson, after mentioning several designs for floating batteries, gives to Abraham Bloodgood of Albany the credit of having laid before 'The Society for the Promotion of the Useful Arts'—the first department of the Albany Institute — an illustration and description of a floating, revolving circular-tower battery, for naval warfare and harbor defense. This was in 1807. A Scotchman, Mr. Gillespie, in 1805 modeled a movable castle or battery, but we are not able to say, in default of any drawing, accessible now, that his device represented in any way the modern monitor turret.

"To a member of the Albany Institute, therefore, is to be attributed the first idealization of the monitor iron-clad turret, which, perfected by Ericsson, formed the invulnerable defense of our coasts during the rebellion."

As we read this, our thoughts must inevitably turn back more than twenty years to a most critical period in our national existence. When forever hidden beneath the smooth surface of Hampton Roads lay the Cumberland, the tomb of many hundred men who had died heroically at their guns,— near by, grounded and wrapped in flames, the Congress,— and at a little distance, her guns still projecting and her fires all aglow for instant renewal of the conflict, the fateful Merrimac. When, as the tidings of the great disaster went forth throughout all the land, from north to south respectively arose the wail of distress and the shout of triumph, and the flag of the Union began to droop and northern anarchy again to lift its head. And when, more dangerous than all else, in Washington the agents of St. James and the Tuilleries were writing their dispatches to the purport that our defense was drawing to an end, and that now a dishonoring peace could be forced upon us. Could it really be that after less than a century of trial, the experiment of the new civilization must come to an ignominious conclusion?

And then we recall how, in that darkest hour, sunlight began to fall upon the picture, when toward morning from behind a sandy point, a queerly-shaped craft emerged, a mere flat raft, as it were, with only an uncouth erection upon its low deck, the circular turret that had had its suggestion in our Transactions. When, with the confidence of some ship that had already won its score of victories instead of having just slipped from off its stocks, the strange craft rushed to the conflict, its two guns projected from its turret, its iron bolts flying fast and unrelenting, until after four hours of conflict the firing ceased

and, through the parting of the smoke, the monster Merrimac was seen seeking with all haste the protection of the port from which she had so lately sallied forth. And when within the hour the wires flashed the tidings north and south, and the late dismay throughout the Union States was drowned with shouts of glorious cheer, and the short-lived exultation of the Confederacy gave way to despair; and, better than all else, St. James and the Tuilleries were made to listen to a different story than that which, a while ago, had been begun for them to hear.

Should it not be a little to our pride and satisfaction, gentlemen, as we look back upon this picture, to think that in the advancement and preservation of ideas which here and there have done service in carrying forward our civilization, the Albany Institute has borne its honorable share?

THE FIRST BATTLE OF LAKE CHAMPLAIN.

HAS CURRENT HISTORY CORRECTLY LOCATED ITS SITE?

By GEORGE F. BIXBY.

[Read before the Albany Institute, November 5, 1889.]

The Champlain Valley has been famous as battle ground. The burden of the first tradition handed down from prehistoric time was of fierce wars which had driven their once numerous inhabitants from these shores and islands. Here, along the "gate of the country," was bloody ground, and it requires little effort of the imagination to conceive the tide of battle as ebbing and flowing past Rock Reggio, the ancient landmark between the savage tribes of the North and the South. The thought strikes one forcibly at the outset, in pursuing a line of inquiry like this, and comparing the old-world records with those of the new, the former reaching back to the earliest human races, that here darkness covers the face of that great deep; that the historic time of this valley spans but a comparative hand-breadth of the past — less than eight generations — and that it would be inexcusable if, even here, manifest errors bearing on important data should, without protest, be awarded a place on the pages of history.

From the numerous conflicts of historic time on Lake Champlain, three stand out with marked distinctness. Seventy-five years ago in September, 1814, the last naval battle between the United States and the "Mother Country" was fought on Cumberland Bay, and thirty eight years before that, in October, 1776, was the first naval battle between the same powers, when the infant republic, under the lion-hearted Arnold, dared to stand up against the mistress of the seas on her own domain. The localities of both these engagements are well and truly marked; the first by the wreck of the *Royal Savage*, one of our own vessels sunk in that action, still visible at low water, and the last by well-attested charts, as well as by the recollection of living witnesses; and it is a remarkable fact that these two important battle grounds, where our first and last naval struggle with Great Britain took place, lie only five miles apart on Lake Champlain, without even a stone raised to commemorate them. The first of these three battles — standing on the outer verge of historic time — was the original "Battle of Lake Champlain," fought two hundred and eighty years

CHAMPLAIN (SAMUEL D^e^)

ago, only eighteen days after the discovery of this valley and its lake by Champlain, this probably being the first conflict, in what is now the State of New York, where firearms were used.

The site of this battle has also been fixed by current history, erroneously fixed, as I believe, and the purpose of this paper is to bring reasons for such belief. It will be remembered that Champlain was on his way through Lake Champlain, going south with a war party of Montagnais Indians against the Iroquois. The party consisted of Champlain and two other Frenchmen and sixty savages, with twenty-four birch bark canoes. They set out from the Fall of the Iroquois river, at Chambly Basin, on the 12th of July, 1609. Champlain in his Journal describes the journey up the river Richelieu and along the west side of the lake, and proceeds thus (Prince Society's translation):

"Now as we began to approach within two or three days' journey of the abode of their enemies we advanced only at night, resting during the day. * * * When it was evening we embarked in our canoes to continue our course and, as we advanced very quietly and without making any noise, we met on the 29th of July the Iroquois, about ten o'clock at evening, at the extremity of a cape which extends into the lake on the western bank (*au bout d'un cap qui advance dans le lac du coste d' l' Occident*). They had come to fight. We both began to utter loud cries, all getting their arms in readiness. We withdrew out on the water, and the Iroquois went on shore, where they drew up all their canoes close to each other and began to fell trees with poor axes, which they acquire in war sometimes, using also others of stone. Thus they barricaded themselves very well.

"Our forces also passed the entire night, their canoes being drawn up close to each other and fastened to poles, so that they might not get separated, and that they might be all in readiness to fight if occasion required. We were out upon the water, within arrow range of their barricades. When they were armed and in array, they despatched two canoes by themselves to the enemy to inquire if they wished to fight, to which the latter replied that they wanted nothing else: but they said that at present there was not much light, and that it would be necessary to wait for daylight so as to be able to recognize each other; and that as soon as the sun rose they would offer battle. This was agreed to by our side. Meanwhile, the entire night was spent in dancing and singing, on both sides, with endless insults and other talk; as, how little courage we had, how feeble a resistance we would make against their arms, and that, when day came, we should realize it to our ruin. Ours, also, were not slow in

retorting, telling them they would see such execution of arms as never before, together with an abundance of such as is not unusual in the siege of a town. After this singing, dancing and bandying of words on both sides to the fill, when day came my companions and myself continued under cover for fear that the enemy would see us. We arranged our arms in the best manner possible, being, however, separated, each in one of the canoes of the savage Montagnais.

"After arming ourselves with light armor, we each took an arquebuse and went on shore. I saw the enemy go out of their barricade, nearly two hundred in number, stout and rugged in appearance. They came at a slow pace towards us, with a dignity and assurance which greatly amused me, having three chiefs at their head. Our men also advanced in the same order, telling me that those who had three large plumes were the chiefs, and that they had only these three, and that they could be distinguished by these plumes which were much larger than those of their companions, and that I should do what I could to kill them. I promised to do all in my power, and said that I was very sorry they could not understand me, so that I might give order and shape to their mode of attacking their enemies, and then we should without doubt defeat them all; but that this could not now be obviated, and that I should be very glad to show them my courage and good will when we should engage in the fight.

"As soon as we had landed, they began to run for some two hundred paces toward their enemies, who stood firmly, not having as yet noticed my companions, who went into the woods with some savages. Our men began to call me with loud cries; and in order to give me a passage-way they opened in two parts, and put me at their head, where I marched some twenty paces in advance of the rest, until I was within about thirty paces of the enemy, who at once noticed me and, halting, gazed at me, as I did also at them. When I saw them making a move to fire at us, I rested my musket against my cheek and aimed directly at one of the three chiefs. With the same shot, two fell to the ground; and one of their men was so wounded that he died some time after. I had loaded my musket with four balls. When our side saw this shot, so favorable for them, they began to raise such loud cries that one could not have heard it thunder. Meanwhile, the arrows flew on both sides. The Iroquois were greatly astonished that two men had been so quickly killed, although they were equipped with armor woven from cotton thread and with wood, which was proof against their arrows. This caused great alarm among them. As I was loading again, one of my companions fired a

shot from the woods, which astonished them anew to such a degree that, seeing their chiefs dead, they lost courage and took to flight, abandoning their camp and fort and fleeing into the woods, whither I pursued them, killing still more of them, and took ten or twelve prisoners. The remainder escaped with the wounded. Fifteen or sixteen were wounded on our side with arrow shots, but they were soon healed.

"After gaining the victory our men amused themselves by taking a great quantity of Indian corn and some meal from their enemies; also their armor, which they had left behind that they might run better. After feasting sumptuously, dancing and singing, we returned three hours after with the prisoners. The spot where this attack took place is in latitude 43° and some minutes, and the lake was called Lake Champlain."

In his explanation of the map accompanying his account of the battle, he says: "The canoes of the enemy were made of oak bark, each holding ten, fifteen or eighteen men."

This is Champlain's account, in full, of the battle, and he says, farther on, that they returned down the lake eight leagues the same day and halted toward evening; also, that the Montagnais had scalped all those they had killed in battle.

Where is the "cape which extends into the lake on the western bank," that Champlain describes as the scene of the first battle of Lake Champlain? Nearly all, if not quite all, authorities agree that it was at or near the spot where Fort Ticonderoga was afterward built, and where its ruins now stand. Watson says (Hist. Essex Co., p. 18): "The place was evidently in the vicinity of Ticonderoga." Thompson (Hist. Vt., p. 2) locates the spot on the shore of Lake George. Palmer says (Hist. Lake Champlain, p. 22): "The engagement took place somewhere between Crown Point and Lake George, probably at Ticonderoga." O'Callaghan (Doc. Hist. N. Y., vol. 3, p. 9, foot-note) says: "The reference in Champlain's map locates this engagement between Lake George and Crown Point, probably in what is now the town of Ticonderoga." Brodhead (Hist. N. Y. vol. 1, p. 18) says: "On the map which accompanies his work, Champlain marks the place where the Iroquois were defeated as a promontory a little to the northeast of a small lake by which one goes to the Iroquois, after having passed Lake Champlain. These particulars seem to identify Ticonderoga as the spot where the first encounter took place between the white men and the red men on the soil of

New York." Slafter, in his memoir of Champlain, published by the Prince Society, locates the battle at Ticonderoga, and argues at some length in support of that view.

This is a strong array of authorities which it may be presumptuous to question, but attention is called to a few plain facts bearing on the matter. Champlain's maps, his picture of the battle and his Journal, together with the natural conformation of the western shore of the lake, are the chief points of interest in the case.

First, as to the map referred to above. This is Champlain's great map of New France, drawn by his own hand, and upon which are delineated the results of his discoveries and observations in the New World during his travels and sojournings, covering a period of over twenty-five years, from 1603 to 1629, along the Atlantic coast from the Gulf of St. Lawrence as far south as Cape Cod and, perhaps, to Martha's Vineyard, along the coast of Labrador, through New Brunswick and Nova Scotia and the Eastern provinces of Canada, up the Saguenay river, through the St. Lawrence to the foot of the Cascades at the head of Lake St. Francis, up the Ottawa river to Lake Nippissing, and through the Georgian Bay, Lake Simcoe, to Lake Ontario, Oneida Lake and Lake Champlain. This map and his journals were made in obedience to the orders of King Henry IV, and the testimony of both map and journals is entitled to the utmost weight. Champlain says in his dedication to the king: "This I do feeling myself urged by a just sense of the honor I have received during the last ten years in commissions, not only, sire, from your majesty but also from the late king, Henry the Great, of happy memory. who commissioned me to make the most exact researches and explorations in my power. This I have done, and added, moreover, the maps." To the Queen Regent, showing his sense of religious obligation, he speaks of his explorations in America, "Where I have always desired to see the Lily flourish, and also the only religion, Catholic, Apostolic and Roman."

On this great map Lake Champlain appears with its islands and rivers and outlines, drawn as near to nature as one might expect from data gathered during one trip through it with a war-party of savages. On the west side, three rivers, only, are marked on this map north of the outlet of Lake George. It will be remembered that Champlain traveled up the lake on the west side, and very slowly, taking seventeen days from Chambly Basin to reach the scene of the battle — only about seven miles a day. Here, then, on this western shore, if anywhere, we may certainly expect accurate mapping, and, more especially,

when it is remembered that Champlain distinguished this lake above all other localities which he discovered or explored, by giving it his own name.

What three rivers are these which he marks? He would hardly have missed the Great Chazy river, with its broad estuary, for the most northerly one. Going southward he would naturally pass the hidden mouth of the Saranac river, three miles westward from Cumberland Head, across Cumberland Bay, and he might easily have missed it, as he did the mouth of the Merrimack in passing down the Atlantic coast in 1605. The Great Ausable river he could hardly have failed of seeing, and he must, undoubtedly, have seen the Boquet river, which has the appearance at its mouth of being the largest of the three mentioned, although it is the smallest. The three rivers, then, which Champlain marked for the west side of the lake were, probably, the Chazy, the Ausable, and the Boquet, there being no river between the most southerly one, the Boquet, and Ticonderoga at the outlet of Lake George. On his map Champlain marked the "cape which extends into the lake on the western side," very distinctly, and placed by it the figure 65, referring to his explanation of this as "the place on Lac Champlain where the Iroquois were defeated." Now this cape, the only one marked on the western side of the lake on Champlain's map, is represented on that map as being about equi-distant from Lake George and the southernmost of the three rivers, the Bouquet, which is about forty-five miles north of the outlet of Lake George, or Ticonderoga; Crown Point being between these points, about fourteen miles north from Ticonderoga. The testimony of the map, then, seems conclusive against the hypothesis that the battle was at Ticonderoga, which lies directly at the outlet of Lake George.

We next come to the Journal of Champlain, and his description of the scene of the battle: "The extremity of a cape which extends into the lake on the western bank." Now, there is no spot in the vicinity of Ticonderoga or between Crown Point and Ticonderoga which answers to this description, the little jutting points along that shore having no resemblance to capes extending into the lake.

The place which has been designated as the scene of the battle is about half a mile north of Fort Ticonderoga. Here the shore trends to the southeast for a short distance, but there is no cape there. The water there is shallow all along the shore, being marked on the United States Coast Survey as only six inches deep, and it will be readily seen that the heavy oak bark canoes of the Iroquois, each carrying ten to eighteen persons could not have landed there.

Thirdly, we come to Champlain's picture of the battle, drawn by himself. In this he represents the savages of both sides, Champlain being at the head of his party of Canadian Indians on the left, and the Iroquois on the right, while well around on the right flank of the Iroquois, and on higher ground than they, are Champlain's two white companions. Now, if the battle was at Ticonderoga, we must assume that Champlain and his party voluntarily threw themselves to the southward of their enemies, towards the enemy's country, in an unknown wilderness, the two white companions putting themselves in even greater peril than the main force, and this with their foes outnumbering them more than three to one. Is it possible to believe that Champlain would commit this mistake, familiar as he was with the wily tactics of the savages? Is it probable that the warlike Montagnais would thus have voluntarily put themselves at this disadvantage, after having already penetrated with extreme caution over a hundred miles into the enemy's country?

The Iroquois landed first, and Champlain and his party had their choice whether to attack from the left or the right. Can it be reasonably supposed that they would have chosen to give battle from the south, where the danger to themselves was certainly greater than if they attacked from the north? The evidence of the journal, of the map, and of the battle picture — all the work of Champlain himself — appears to combat the supposition that the battle could have been fought at Ticonderoga.

Where then was it fought?

I believe all the reliable evidence in the case points to Crown Point, where the French erected Fort Frederick, their extreme outpost in 1731, the ruins of which, with enclosing earthworks, are still visible near the northern shore, while farther inland stand the stone barracks of the Amherst fort.

Here is a locality which perfectly answers to Champlain's description of "a cape which extends into the lake on the western bank," and here is the only spot, at the extremity of the cape, and thence around to the head of Bay St. Frederick, as the French named it, now Bullwagga Bay, where the western shore trends to the northward, and the only spot on the western side of that part of Lake Champlain, where a skilled warrior like Champlain, and savages like his allies, would have been likely to attack their foes from the left and north, rather than from the right and south. In fact this is the only point along the entire west shore of Lake Champlain where the shore line takes a northerly direction, with the exception of Willsborough Point,

THE FIRST BATTLE OF LAKE CHAMPLAIN.

about thirty miles north of Crown Point, where the shore is a precipitous bluff. Crown Point also corresponds with Champlain's map. Take the United States Coast Survey of the lake and reduce it to the scale of Champlain's map, and Crown Point stands out as distinctly beyond the general shore line as does the cape which is marked on Champlain's map, as the location of the battle, and Crown Point also approximates in position to this cape, marked on Champlain's map as between Ticonderoga and the Boquet river.

Again, all the old French maps marked Bullwagga Bay, the shore of which terminates in Crown Point, as the head of Lake Champlain, and that portion southward as Wood Creek. The lake above this point certainly partakes more of the character of a river than a lake, especially from Crown Point to Ticonderoga, being but a little over a mile wide in the entire distance of fourteen miles, while at some points it is only a third of a mile wide. Is it possible that so close an observer as Champlain, acting under his king's command, would have neglected to mention this remarkable change in the contour of the lake, had he traversed this portion, or that he would not have called it a river, as he called the outlet a river as far south as Rouses Point or Windmill Point, although that outlet for thirty miles below Rouses Point averages nearly or quite as wide as does this part of the lake between Crown Point and Ticonderoga?

The fact that on his map no indication appears of this remarkable narrowing of the lake into a river certainly affords good basis for the assumption that he never saw this portion of the lake, and that Crown Point was the southern limit of his exploration of Lake Champlain. Mark in this connection Champlain's language already quoted: "The spot where this attack took place was in latitude 43° and some minutes, and the lake was called Lake Champlain." Thus the evidence of the journal and the map and the battle picture indicate that Crown Point, and not Ticonderoga, was the scene of the battle.

What basis to rest upon, then, has the assumption, so universally concurred in by historical authorities, that the battle was at Ticonderoga or above Crown Point?

First, Champlain says, in his journal: "The spot where this attack took place is in latitude 43° and some minutes." Now, if the latitude is correctly given by him there is an end of all controversy, as Crown Point lies in latitude 44° 2′, while the point where current history has fixed the battle is in latitude 43° 51′.

How did Champlain determine the latitude? He undoubtedly did it with the astrolabe, and it is a remarkable circumstance that an in-

strument was picked up in 1867, on one of Champlain's portages of 1613 in the township of Ross, County Renfrew, in the province of Ontario, bearing the date of 1603, which good authorities concur in believing to be Champlain's astrolabe. The instrument is described by Mr. A. J. Russell, the author of a *brochure* published in 1879, entitled, "Champlain's Astrolabe, lost on the 7th of June, 1613, and found in August, 1867," as a circular brass plate, having a diameter of five inches and five-eighths. He says: "It is of plate brass, very dark with age, one-eighth of an inch thick above, increasing to six-sixteenths of an inch below, to give it steadiness when suspended, which apparently was intended to be increased by hanging a weight on a little projecting ring at the bottom of it, in using it on shipboard. Its suspending ring is attached by a double hinge of the nature of a universal joint. Its circle is divided into single degrees, graduated from its perpendicular of suspension. The double-bladed index, the pivot of which passes through the centre of the astrolabe, has slits and eyelets in the projecting sights that are on it." The manner of using the astrolabe is described thus: "Let the astrolabe be suspended so that it shall hang plumb. Direct the index to the sun at noon, or to the North star, so that the same ray of light may shine through both holes in the two tablets or pinules on the index, and the index will point to the degree of the sun's meridian altitude, indicated on the outer rim of the astrolabe."

It will be observed from the description that the entire span of the graduated circle is less than eighteen inches, and that consequently the length of each degree as marked upon it is less than one-twentieth of an inch. When this is taken into consideration, together with the fact that Champlain's observations were made while surrounded by a war-party of savages, in an enemy's country, with but little leisure, it would not be strange if he made an error. As a matter of fact his records of latitude throughout his explorations are now definitely known to be full of errors, notwithstanding most of them were made under far more favorable circumstances than these on Lake Champlain.

Thus, in Champlain's first exploration in Canada in 1604, he marked the harbor of St. Margaret, now Weymouth Harbor, on the southern shore of St. Mary's Bay, as in latitude 45° 30′ an error of 1° 7′, the true latitude being 44° 23′. The true latitude of the Island of St. Croix is 45° 37′ and he made it 46° 40′, an error of 1° 3′. He made a point in the Richelieu river north of Chambly Basin in latitude 45°, an error of some 45′. To a well-marked cove in Moisie Bay

CHAMPLAIN'S GREAT MAP — PARIS. 1632.

he gave the latitude of "51° and some minutes," an error of at least 41′. The Basin of Mines, La Cadie, which he puts in latitude "44° and some minutes," has a latitude of 45° 30′, an error of 90 nautical miles. The latitude of Bangor, Me., is 44° 46′, and he made it 45° 25′. Ward Island, at the mouth of the Saco, which he placed in latitude 43° 45′, has a latitude of 43° 27′. He made the latitude of Cape Ann "43° and some minutes," and its true latitude is 42° 39′ 43″. Brant's Point, near Boston, he placed in latitude 42° 45′, an error of 40′. Nauset Harbor, Cape Cod, was placed by him in latitude 42°, an error of 12′, and in giving the latitude of Ten Pound Island, Gloucester Bay, he made an error of 24′. The nearest approximation to exactness in all Champlain's records is in giving the latitude of Port Sainte Helaine as 44° 41′, "more or less," an error of only one minute, his usual variation being from 10′ to 30′ or more. In fact, it would be remarkable if it were otherwise, considering the rudeness of his appliances and the probability that no allowance was made for refraction.

Now, Crown Point being in latitude 44° 2′, and Ticonderoga, which has been accepted as the site of the battle, in latitude 43° 51′, the error in this case would be only 11′, or far below Champlain's average, allowing that the battle ground was at Crown Point, in latitude 44° 2′, instead of at Ticonderoga in latitude "43° and some minutes."

There is another expression in Champlain's journal, which, with that just considered, evidently constitutes the foundation of the hypothesis that the first Battle of Lake Champlain was at or near Ticonderoga.

Champlain in the narration of this voyage, detailing occurrences of several days before the battle, speaking of the mountains to the southward, says: "The savages told me that these mountains were thickly settled, and that it was there we were to find their enemies; but that it was necessary to pass a fall in order to go there, (which I saw afterward) when we should enter another lake nine or ten leagues long," etc. Champlain here, undoubtedly, refers to Lake George, and to the fall below its outlet, which now furnishes water power for the manufacturing village of Ticonderoga, and it has been argued that he must have seen this fall on the day of the battle, there being no reason for believing that he ever returned to this locality, and, consequently, that the battle must have been as near to this fall as the point on the shore where it has been located — a distance of something over two miles.

Now, it will be remembered that, in his narrative of events of July 30, he says, the Iroquois, "seeing their chiefs dead, lost courage and took to flight, abandonding their camp and fort and fleeing into the

woods, whither I pursued them, killing still more of them. Our savages also killed several of them and took ten or twelve prisoners. * * * After gaining the victory our men amused themselves by taking a great quantity of Indian corn and some meal from their enemies, also their armor. After feasting sumptuously, dancing and singing, we returned, three hours after with the prisonera," and "after going some eight leagues, toward evening, they took one of the prisoners," etc., and he proceeds to detail the scenes of torture in the camp. The day had witnessed the battle, the sack of the fort and camp, the dancing and singing and feasting and, finally, the journey of eight leagues, and still it was only "toward evening." No hint is given of any extended pursuit of the Iroquois through the dense wilderness and, with so much crowded into the day, there could have been little time for such pursuit. To have seen the falls of Ticonderoga Champlain must have gone some two miles from the spot which has been fixed by historians as the battle-ground, burdened with his heavy arquebuse, abandoning his base of supplies, and plunging into an unknown wilderness in pursuit of a fleet and unincumbered foe, which still outnumbered his own force, nearly or quite three to one, and exposing himself to the danger of a deadly ambuscade. What object could he have had in incurring this danger? Did he see these falls on the day of the battle? Is it probable that he saw them then and neglected to mention this significant fact in its proper place in his journal?

This was one of his most important and most perilous voyages of discovery. He had penetrated over a hundred miles into the enemy's country, and may it not be fairly presumed that, here, at the end of that journey he would have noted on the day of its occurrence so remarkable a circumstance as this? Note the expression, "which I saw afterwards." In the Prince Society's translation this phrase is in parenthesis. Why? Did the translator have doubts or suspicions of it? It would seem so, else so important an expression would not have been thus slighted. It might prove an interesting study to trace the history of this phrase, so significantly cut out from the main narrative and parenthetically degraded by the translator. Are there grounds for the suspicion that it may be an interpolation?

At the time of Champlain's explorations, two religious orders in the Catholic church were struggling with each other for precedence, not only in the Old World but in this great missionary field just opened in the New World. The Récollets came over with Columbus in 1493 and were in Canada in 1615, and their rivals, the Jesuits, were here even before that, and were firmly established in New France in 1633.

FROM U. S. COAST SURVEY — SHOWING CROWN POINT.

Mr. Otis, in his preface to his translation of Champlain's journals hints at tampering with the journals of Champlain, (vol. 1, p. 220) and says: "All favorable allusion to the Récollets, to whom Champlain was friendly, are modified or expunged in editions subsequent to the first, while the Jesuits are made to appear in a more favorable light." This is, at least, suggestive of the key to a possible motive for precisely such an interpolation as this, based on the desired establishment of the alleged fact that Champlain, an adherent of the Récollets, and so zealous a Catholic that he might almost be ranked as a missionary as well as explorer,[1] was the first discoverer of Lake George, or its outlet, thirty-five years before it was seen by Father Jogues, whom history names as the first white man who saw it. A suggestive fact may be stated in this connection — that on Champlain's small map of 1613 ("Geographical Map of New France, in its True Meridian") a cross is marked on Lake George, indicating pretension to discovery or possession by Catholic missionaries thirty-one years before its discovery by Father Jogues.

The language of the phrase in parenthesis is at least ambiguous. The Indians told him "It was necessary to pass a fall to go there, (which I saw afterwards)." What did he see? Literally, Champlain did not say that he saw the fall, afterwards, but that afterwards he saw it was necessary to pass the fall. It seems probable that what he meant was that he perceived, or found, or became convinced, that one must pass the fall to go to the lake; that he verified what the friendly savages had told him. This he might have done through the Iroquois prisoners, of whom his party had taken ten or twelve, and it is reasonable to suppose that he would obtain what information he could from them.

The language leaves a doubt as to its author's meaning, and in judging of it all circumstances bearing upon the matter should be taken into consideration. It is undeniable that all the other evidence in the case forbids the supposition that Champlain could have seen the fall on the day of battle, even had it been fought at Ticonderoga or near there. In many other instances the language of Champlain's journals is doubtful and susceptible of double meaning. Thus, in the journal of his voyage of 1603, he speaks of a "horrible monster * * * which the savages called the Gougou * * * This monster makes horrible noises in this island which the savages call Gougou," etc. Here he evidently means that the monster is called Gougou, but construed literally he says the savages call the island "Gougou." Again, in his explanation of his great map, he describes the Richelieu river as "very beautiful, with many islands and meadows. It comes

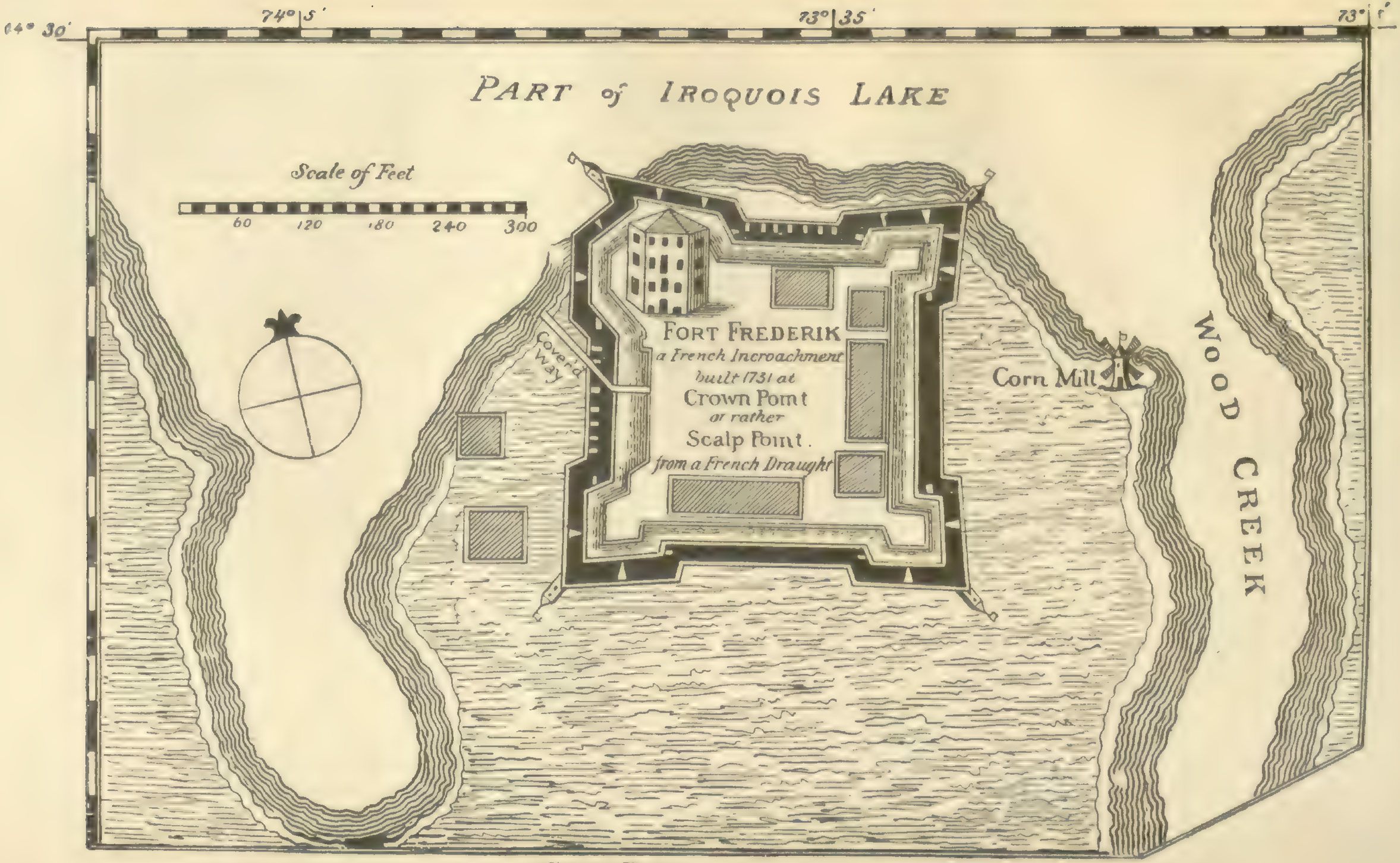
from Lac de Champlain, five or six days' journey in length," etc., leaving it uncertain whether it is the lake or the river which he is describing. And once more, he says: "Having asked whence comes the river Norumbegue, he told me that it passes the fall, and that one journeying some distance on it enters a lake by way of which they come to the river of St. Croix," etc. Here Champlain could not, as his translator points out, have meant the river St. Croix, but rather the river in which was the island of St. Croix. Many such instances might be cited from Champlain's journals. Mr. Charles Pomeroy Otis, the translator of the Prince Society's edition of Champlain's voyages, says: "The language used by Champlain is essentially the classic French of Henry IV. * * * But, though using in general the language of court and literature, he offends, not unfrequently, against the rules of grammar and logical arrangement. * * * Indeed, one rather wonders that an unpretending explorer writes so well. It is the thought, not the words, which occupies his attention."

It is proper to note here that while, previously to the battle, Champlain gives dates in his journal, none are given after the battle, until the war party arrives at Quebec, the first date noted being the 8th of September, thirty-nine days after the battle, and that it is possible, though altogether improbable, that he might have returned and seen the fall during this time, before leaving the lake.

There is one more important consideration. The old Indian name for Crown Point was "Ten'yadoughnigaugee," which signified "two points opposite to each other." (See map accompanying Pownall's Topographical Description, 1776.) When the French assumed ownership of Lake Champlain, they discarded nearly all the Indian names, substituting their own. This point they called Point au Chevelure. What did that name signify? An old plan or chart of Fort Frederick, preserved in the library archives of a New England town, gives a clue.

It represents Crown Point, with Fort Frederick, its tall tower armed with cannon, and ground plans of the small church and other buildings, within the earthwork enclosure, and it bears title, "Ft. Frederick, a French Incroachment, built 1731 at Crown Point, *or rather Scalp Point.* From a French draft." This plan bears neither date nor other explanation, but the phrase "French Incroachment," marks it as of English origin, and of course it must have been drawn before 1759, when the fort was destroyed and the country was relinquished by the French. On this copy of a "French Draft," Point au Chevelure, or Crown Point, or Scalp Point, is marked as the southern limit of Lake

FROM U. S. COAST SURVEY—SHOWING TICONDEROGA AND COAST NORTHWARD.



74° 5'
73° 35'
73°
PART of IROQUOIS LAKE
Scale of Feet
60
120
180
240
300
FORT FREDERIK
a French Incroachment
built 1731 at
Crown Point
or rather
Scalp Point.
from a French Draught
Cover'd Way
Corn Mill
WOOD CREEK

SCALP POINT.

Champlain and the narrow continuation of it above is marked "Wood Creek." Now it is a most significant fact that on all, or nearly all the old French maps of Lake Champlain this point bears the name "au Chevelure," or "Scalp Point," as rendered by this plan referred to.

Whence came that name so indicative of bloody work? It is the only name on these old maps of Lake Champlain that bears such signification. We find Point au Fer, Point Algonquin, Cape Scomoton as applied to prominent features below, and "Cheonderoga," signifying "Three Rivers," which is now Ticonderoga, where we have been taught to believe the battle was, but nowhere on any of these maps of Lake Champlain is there a name except this which appears to have been applied to commemorate bloodshed or warfare.

Now the first Battle of Lake Champlain was a notable event in the early annals of this region. The first discharge of Champlain's arquebuse awoke new echoes which heralded the end of savage dominion and the advent of civilization, with its better modes of living and of killing. Is it likely that the early French chroniclers with their habits of careful observation of the minutest things would have omitted to hand down the memory of that first battle of Frenchmen with savages? Or is it probable that they would have applied a name indicating Indian warfare to a point where no notable act of Indian warfare took place and give to the only bloody spot the peaceful name of "Three Rivers?" In that battle about two hundred and sixty men were engaged—a great force for that time, when the lines of transportation were wilderness trails and fleets were made from the bark of trees. The first naval battle between England and the United States had only about four times that number of men engaged, and the last naval battle between these powers had less than two thousand men. In this first battle of Lake Champlain the force of the Iroquois was nearly decimated, and many scalps were taken — a feature of warfare strange to civilized Frenchmen. What can be more likely than that the scene of such a conflict, which has had no parallel in significance since, on these waters, would be appropriately named, and what name could be more fitting than Point au Chevelure or Scalp Point? It seems hardly probable that the site of this battle would go unnamed, with such a minute and graphic description of it as Champlain spread out on the historic annals of that time. They certainly gave no point above this on the lake, a name, in the slightest degree indicating warfare. Ticonderoga, as we have seen, is from a word signifying "Three Rivers"— the river from Lake George, the river from the upper end of Lake Champlain, and the East Creek, the three joining here and flowing down to the lake, con-

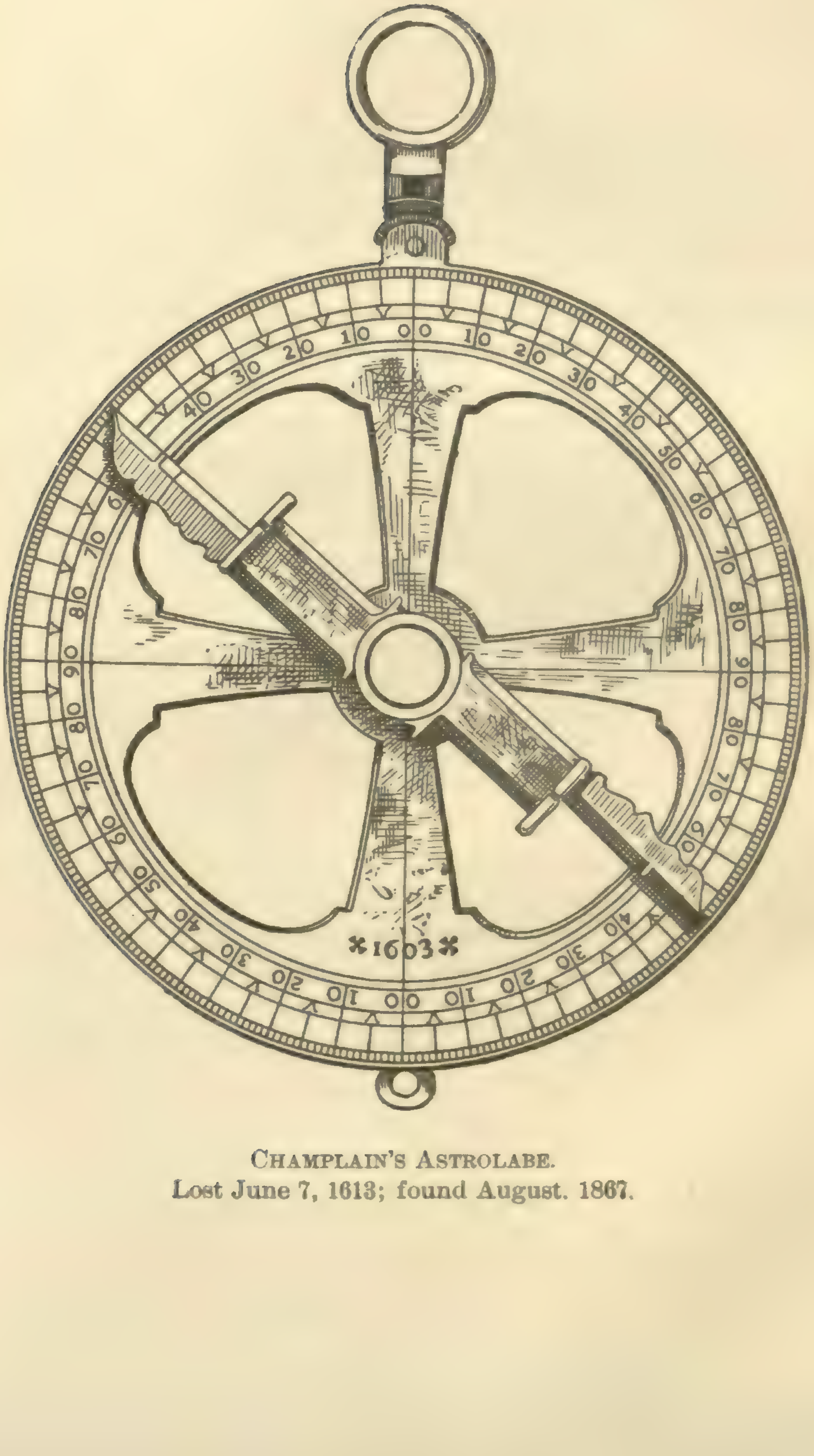
stituting Wood Creek, named also "Ossavages" on one old map? All other points on the west side of the lake where the battle could have possibly taken place are left nameless on the old French maps except Point au Chevelure, Crown Point, or Scalp Point. Is not this strong presumptive evidence that there was the battle?

Champlain, in his rude map of Lake Champlain, plainly marked the "cape which extends into the lake," placing by it the number 65, referring to his explanation of this as the site of the battle, this cape being the most prominent projection on the western shore. The French map-makers, following him, gave the outline of the lake with remarkable accuracy, and they too marked the "cape which extends into the lake," and gave it a name which commemorates bloodshed, and to-day, no observant traveler, following Champlain's course up the lake can fail to be struck with Crown Point as answering more completely to Champlain's description of the site of his battle than any other locality where the battle could have possibly been fought.

All along down the course of historic time Crown Point has been noted as one of the grand strategic points of the Champlain valley. Here an outpost was established by the English in colonial times, near the close of the seventeenth century; here, in 1731, the French built Fort Frederick, making a bold advance from their former frontier a hundred miles north; from this point the great military road was built across the mountains to the Connecticut; here, under the guns of Fort Frederick, was the first church in the Champlain valley, the Jesuit Fathers planting the cross beside the French lily according to their custom, as if in obedience to Champlain's desire; here the walls of the great Amherst fort — said to be the most massive and best preserved of all the Revolutionary or pre-Revolutionary military ruins of the North — began to rise in the very month that the French were finally driven out of the valley; here, doubtless, at the head of the "lake which is the gate of the country," was the scene of many bloody encounters between the two great nations of savages before the white men came; here, the best evidence concurs in showing, was the spot where the Iroquois built the first fort since the dawn of historic time, in the Champlain valley, on the night of July 29th, two hundred and eighty years ago, and here, on the morning of the 30th of July, 1609, was fought the first Battle of Lake Champlain.

(1) He (Champlain) was upright and amiable in his deportment — was zealous in propagating the Roman Catholic faith, and was often heard to remark that "The salvation of one soul was of more value than the conquest of an empire." — (Thompson's Vermont, Part 2, p. 2, foot-note.)

(2) Map accompanying Pownall's Topographical Description 1776.



CHAMPLAIN'S ASTROLABE.
Lost June 7, 1613; found August. 1867.

THE LIQUOR QUESTION.

By EUGENE BURLINGAME.

[Read before the Albany Institute, November 19, 1889.

In casting about for a topic, the discussion of which might not be unprofitable at this time, I decided to invite your attention to some observations upon the liquor question, considered from a legal and political standpoint.

In approaching to a near view of this question we are brought to a realizing sense that the present agitation presents very little that is new, either as to the evils resulting from an immoderate use of intoxicants or as to the remedies aimed to correct its abuses. Authentic history scarcely goes back to a time when intoxication, resulting from the immoderate use of spirituous liquors, was not a recognized vice, which demanded and received the attention of those in authority to limit or prevent the consequences resulting therefrom. The statement in Genesis, "And Noah began to be an husbandman, and planted a vineyard, and drank of the wine and was drunken," etc., is regarded by eminent critics as referring to the revival of general husbandry, and not to some new thing in the way of the culture of the vine, so that it seems reasonable to suppose that the vine was cultivated before the flood, and that the experience recorded of Noah does not take us back to its origin.

The great Chinese philosopher, Confucius, and his eminent disciple Mencius, were not only eminent as teachers of their nation, for which they are greatly reverenced, but also rendered signal service by editing and perfecting two great works of historic value: "The Shoo-King, or History," and "The She-King, or Book of Ancient Poetry," a series of writings handed down through many generations, together with the commentaries written thereon by the ancient wise men. From these books we learn that intemperance was frequently putting the empire in danger, and that stringent measures for its suppression were often employed. The earliest account in the "Shoo-King" is the following, in the year 2187 B. C.: "T'ae-K'ang occupied the throne like a personator of the dead. By idleness and dissipation he extinguished his virtue, till the black-haired people all began to waver in their allegiance."

Another account goes back to 2154 B. C., in the reign of Chung-K'ang: "He and Ho had neglected the duties of their office, and were sunk in wine in their private cities, and the prince of Yin received the imperial charge to go and punish them." He and Ho were ministers of the board of astronomy, but through their licentious indulgences unfitted themselves for their duties, and, in consequence, the people, dependent on them for knowledge of the times and seasons, received no light and guidance. An eclipse comes on them unawares, and the astronomers are too much intoxicated to notice it. The prince of Yin assembles his troops and delivers an address to them, in the course of which he says: "Now, here are He and Ho. They have entirely subverted their virtue, and are sunk and lost in wine. They have violated the duties of their office, and left their posts. They have been the first to allow the regulations of Heaven to get into disorder, putting far from them their proper business. On the first day of the last month of autumn, the sun and moon did not meet harmoniously in Fang. The blind musicians beat their drums; the inferior officers and common people bustled and ran about. He and Ho, however, as if they were mere personators of the dead in their offices, heard nothing and knew nothing; so stupidly went they astray from their duty in the matter of the heavenly appearances, and rendering themselves liable to the death appointed by the former kings."

Again, 1122 B. C. The Emperor Chow becomes dissolute, "being lost and maddened with wine." His pernicious example is so generally followed that the viscount of Wei finds it impossible to rule in his principality. He seeks the grand and junior tutors, and inquires what can be done. They give him no help. The dynasty is too corrupt to be changed, and nothing but its overthrow can be looked for. The account proceeds: "King's son, heaven in anger is sending down calamities, and wasting the country of Yin. Thence has come about that lost and maddened condition through wine. He has no reverence for things which he ought to reverence, but does despite to the aged elder, the old official fathers."

In the "She-King" are many allusions to the habits of the people. The custom of drinking healths about 1496 B. C. is thus described:

"In the tenth month they sweep their stack-sites,
The two bottles of wine are enjoyed,
And they say, let us kill our lambs and sheep,
And go to the wall of our prince,
There raise the cup of rhinoceros horn,
And wish him long life, that he may live forever."

The drinking customs in ancient India can be traced back upwards of twelve hundred years B. C. The Rig-Veda, or sacred books of the Brahmas, contained the ancient hymns, as recited or sung by the priests when engaged in their official duties. Their religious ceremonies were chiefly sacrificial, and the principal sacrifice was called "Soma," after an intoxicating drink made from the juice of a creeping plant. This plant, after being cleaned and macerated in water, was pressed between stones, and the juice, strained through ram's wool, was mixed with malt and clarified butter, and then fermented. The sacrifice was made by pouring the fermented liquid on the sacred fire, where it was supposed to be drank by the gods. Sometimes it was believed to be miraculously transformed into the god himself, and so is occasionally addressed as a person. Indra was the god to whom the Soma was most frequently offered, and unless he was intoxicated with it nothing was expected from him, while all his great exploits were said to be from his "exhilaration with Soma." James Samuelson, in his "History of Drink," refers to Langlois' translation of the Rig-Veda as authority for asserting that, "Just as in one of the Hebrew psalms every verse ends with the words, 'For His mercy endureth forever,' so in one hymn to Indra, each verse concludes with, 'In the intoxication which Soma has caused him, see what Indra has accomplished.'" It is evident that the people, as well as the gods, were partakers of Soma.

That intoxicants were in common use by the Persians, hundreds, and perhaps thousands of years B. C. are facts of recorded history. Herodotus, who wrote about 450 B. C., says: "The Persians are much addicted to wine. They used to debate the most important affairs when intoxicated; but whatever they have determined on in such deliberations, is, on the following day, when they are sober, proposed to them by the master of the house where they have met to consult; and if they approve of it when sober also, then they adopt it; if not, they reject it; and whatever they have first resolved on when sober, they reconsider when intoxicated." He also relates that when Cyrus, about 538 B. C., made war upon the Massagetae, of Central Asia, he made a feint of deserting his camp, leaving in it flowing goblets of wine, which tempting the enemy to excess, Cyrus attacked them and gained a victory.

Intoxicating drinks were made and used by the Egyptians. Herodotus says, "They used wine made of barley." From Genesis we are informed that the vine supplied grapes for the king's table in the time of Joseph, 1876 B. C., and that it was the duty of the butler to press

the grapes into Pharaoh's cup, and then deliver the cup into Pharaoh's hand.

Four hundred years B. C. Plato ordained that boys should never taste wine at all, and men of thirty years of age should drink sparingly, if at all, but those who are forty should feast at large banquets and invoke the gods, especially Bacchus, since he gave wine as an antidote against the austerity of old age. Here we may observe, is a very eminent and ancient authority for prohibition, regulation and license.

There is a Grecian legend that contains some suggestive thoughts, and, at the same time, describes the consequences in ancient times of immoderate wine-drinking, that so closely resemble the experience in modern times that I venture to reproduce it: "When Bacchus was a boy he journeyed through Hellas to go to Naxia; and, as the way was very long, he grew tired, and sat down upon a stone to rest. As he sat there, with his eyes upon the ground, he saw a little plant spring up between his feet, and was so much pleased with it that he determined to take it with him and plant it in Naxia. He took it up and carried it away with him; but, as the sun was very hot, he feared it might wither before he reached his destination. He found a bird's skeleton, into which he thrust it, and went on. But in his hand the plant sprouted so fast that it started out of the bones above and below. This gave him fresh fear of its withering, and he cast about for a remedy. He found a lion's bone, which was thicker than the bird's skeleton, and he stuck the skeleton, with the plant in it, into the bone of the lion. Ere long, however, the plant grew out of the lion's bone likewise. Then he found the bone of an ass, larger still than that of the lion. So he put the lion's, containing the bird's skeleton and the plant, into the ass's bone, and thus he made his way to Naxia. When about to set the plant, he found that the roots had entwined themselves around the bird's skeleton and the lion's bone and the ass's bone; and, as he could not take it out without damaging the roots, he planted it as it was, and it came up speedily, and bore, to his great joy, the most delicious grapes, from which he made the first wine, and gave it to men to drink. But, behold a miracle. When men drank of it, they first sang like birds; next, after drinking a little more, they became vigorous and gallant like lions; but, when they drank more still, they began to behave like asses."

Every school-boy is familiar with the excesses of the ancient Romans.

The Jews were also afflicted by the consequences of excessive indulgences. In Exodus we have a sad account of the irreligion and licentiousness into which the children of Israel fell, on the occasion of the feast in which they indulged, "When they sat down to eat and to drink, and rose up to play." In the time of the Judges drunkenness had become so common in Israel as to have involved even the women in its shame. The daughters of Belial had for their associates the sons of the judge and high priest, who were so debauched as to be called the "sons of Belial." Under the strong rule of Saul, and the wise government of David, the nation regained its position and Divine favor, but drunkenness soon worked mischief in the royal household, and produced discord and rebellion. David made use of the severest terms in reprobating the use of wine, and, when endeavoring to set forth the idea of the judgments of the Almighty, he chose the figure of the inebriating cup in the hand of Jehovah, which, as He pours it out upon the nations, spreads terror and desolation wherever it falls. "In the hand of the Lord there is a cup, and the wine is red; it is full of mixture, and He poureth out of the same; but the dregs thereof all the wicked of the earth shall wring them out and drink them."

Solomon, out of a deeper and more varied experience than that of David, wise above all others, exclaims: "Wine is a mocker, strong drink is raging: and whosoever is deceived thereby is not wise." Then he lifts up his voice in warning: "Look not thou upon the wine when it is red, when it giveth his color in the cup, when it moveth itself aright. At the last it biteth like a serpent and stingeth like an adder." Isaiah, who flourished just before the Babylonian captivity, describes the immoral condition of the masses, and ascribes their predicted ruin to their intemperate habits: "Woe unto them that rise up early in the morning that they may follow strong drink; that continue until night till wine inflame them." * * * "Woe unto them that are mighty to drink wine, and men of strength to mingle strong drink: which justify the wicked for reward, and take away the righteousness of the righteous from him." When he denounces woe upon Samaria, it is because of intoxication: "Woe to the crown of pride, to the drunkards of Ephraim, whose glorious beauty is a fading flower, which are on the head of the fat valleys of them that are overcome with wine. Behold, the Lord hath a mighty and strong one, which as a tempest of hail and a destroying storm, as a flood of mighty waters overflowing, shall cast down to the earth with the hand. The crown of pride, the drunkards of Ephraim, shall be trodden under feet. * * * They have erred through wine,

and through strong drink are out of the way; the priest and the prophet have erred through strong drink; they err in vision, they stumble in judgment."

In the woes denounced on the people, by Joel, the class doubtless esteemed by him the most guilty, he addressed: "Awake, ye drunkards, and weep; howl all ye drinkers of wine." Habakkuk, foretelling the ruin of Judea, by the Chaldeans, assigned as a reason that Nebuchadnezzar, the king, "trangresseth by wine;" and exclaims, "Woe unto him that giveth his neighbor drink, that puttest thy bottle to him, and makest him drunken also." The Philistines, at a great sacrifice unto Dagon, their god, made themselves drunken with wine and had Samson brought out of his prison house for their diversion.

The Babylonians were inordinate drinkers. In Daniel we have an account of the feast made by Belshazzar, the king, during which the sacred vessels taken from the temple at Jerusalem were brought in for the use of the king, his princes, his wives and his concubines, that they might drink therein. And while they thus drank wine, the handwriting on the wall appeared. During the night, Cyrus and the Persian troops entered the city, and "in that night was Belshazzar, the king of the Chaldeans, slain." In the Book of Esdras, the following is attributed to one of the body-guard of Darius, king of the Medes and Persians: "O ye men, how exceedingly strong is wine: it causeth all men to err that drink it: it maketh the mind of the king, and of the fatherless child to be all one: of the bondman and of the freeman, of the poor man and of the rich: it turneth also every thought into jollity and mirth, so that a man remembereth neither sorrow nor debt: and it maketh every heart rich, so that a man remembereth neither king nor governor, and it maketh to speak all things by talents; and when they are in their cups they forget their love both to friends and brethren, and a little after draw out swords; but when they are from the wine, they remember not what they have done."

In Germany, England, Russia, France and the other European countries, intoxication, from the earliest times, has been an evil against which the people have constantly struggled. It was not confined to any particular class. Tacitus says: "The German thinks the soul is never more open to sincerity, nor the heart more alive to deeds of heroism, than under the influence of the bottle; for then, being naturally free from artifice and disguise, they open the inmost recesses of their minds; and the opinions which are thus broached they again canvass the next day. There is safety and reason attached to both

modes; for they consult when they are not able to dissemble, and debate when they are not likely to err." He further says: "The liquor commonly drunk by them is prepared from barley, or wheat, which, being fermented, is brought somewhat to resemble wine. * * * They satisfy their appetite without deserts or splendid appendages. The same abstinence is not observed with regard to the bottle, for if you will indulge them in drunkenness to the extent of their desires, you may as effectually conquer them by this vice, as with arms."

All accounts agree that both the higher and the lower classes, the religious and the indifferent alike, were debauched by drink. A story is told of a German bishop, that, being exceedingly fond of wine, it was his custom to send his valet forward with instructions that he should taste the wine at every place where he stopped, and write under the "bush" (a bunch of evergreens hung up over the entrance of houses where wine was sold), the word "est," if it was tolerable, and "est, est," if it was very good; but where it was indifferent, he should not write any thing. The valet arrived at Monte Fiascone, and so much admired the wine that he wrote up "est, est." The bishop soon followed, found the wine so palatable that he got drunk, and repeating the experiment too often, drank himself dead. His valet thereupon wrote his epitaph, as follows:

"'Est, est,' propter nimium 'est,'
Dominus meus, mortuus 'est.'"

Which may be rendered:

'Tis, 'tis,' from too much 'tis,'
My master dead 'is.'

But it can scarcely be necessary, before this audience, to produce any extended evidence of the wide-spread and far-reaching habit of intemperance from the earliest times, nor to prove by the facts of history that it has continued with unabated zeal to the present time, among the nations of the earth that can claim any approach towards "civilization, ancient or modern."

While in its character, extent and effects we are confronted with little that is new, or different, from what has passed before our time, essentially the same means have been adopted from the earliest times to prevent and counteract its evil effects. Personal penalties, as a punishment for intoxication, license, regulation and prohibition, as well as the non-enforceable character of contracts with reference thereto, are nearly as old as history itself, and yet neither the experi-

ence nor wisdom of men has been able, up to the present time, to devise any plan upon which all, or substantially all, temperance people can unite and work with one accord to minimize its injurious effects. It is written in Deuteronomy, xxi, 18: "If a man have a stubborn and rebellious son, which will not obey the voice of his father, or the voice of his mother, and that, when they have chastened him, will not harken unto them: * * * they shall say unto the elders of his city, this our son is stubborn and rebellious, he will not obey our voice, he is a glutton and a drunkard. And all the men of his city shall stone him with stones, that he die; so shalt thou put away evil from among you; and all Israel shall fear." In Leviticus, x, 8–11, it is written: "The Lord spake unto Aaron, saying: Do not drink wine nor strong drink, thou, nor thy sons with thee, when ye go into the tabernacle of the congregation, lest ye die. It shall be a statute forever throughout your generations. And that ye may put difference between holy and unholy, and between unclean and clean. And that ye may teach the children of Israel all the statutes which the Lord hath spoken unto them by the hand of Moses."

The debauchery in ancient India, sanctioned by the religious sacrifices which necessitated inordinate drunkenness on the part of those who participated in them, became so alarming as to imperil the life of the nation. It was about the ninth century B. C., that Manu was accepted as the religious and moral law-giver of the people, who placed before them the Institutes or Hindoo Law. A few extracts will suffice to show how severely this ancient lawgiver dealt with the vendors and partakers of intoxicants: "Never let a priest eat part of a sacrifice performed by those who sell fermented liquor." "Money due for spirituous liquors, the son of the debtor shall not be obliged to pay." "A contract made by a person intoxicated is utterly null." "A wife who drinks any may at all times be superseded by another wife." Sellers of spirituous liquors are classed with gamesters, revilers of scripture, etc., and shall be instantly banished from the town. "Those wretches," it is said, "lurking like unseen thieves in the dominion of a prince, continually harass his good subjects with their vicious conduct."

"For drinking spirits, let the mark of a vinter's flag be impressed on the forehead with a hot iron. With none to eat with them, with none to sacrifice with them, with none to read with them, with none to be allied by marriage with them, abject and excluded from all social duties, let them wander over this earth; branded with indelible marks, they shall be deserted by their paternal and maternal relations,

treated by none with affection, received by none with respect: such is the ordinance of Manu."

"Since the spirit of rice is distilled from the mala, or filthy refuse of the grain, and since mala is also a name for sin, let no Brahmin drink that spirit."

"When the divine spirit, or the light of holy knowledge, which has been infused in the life of a Brahmin, has once been sprinkled with any intoxicating liquor, even his priestly character leaves him, and he sinks to the low degree of Sudra."

The Greeks dealt with drunkenness in a very determined manner. Archons of the court of Areopagus were made inspectors of the public morals, and authorized to rigorously punish intemperance. To have even dined at a public house disqualified one for a seat in that renowned senate and court. For an Archon to be intoxicated was a capital offense, punished with death. Isocrates is quoted as saying of this period in the history of Athens that not even a servant in the city would be seen eating or drinking in a public house.

The Spartans, according to Plutarch, made their servants drunk once a year, in order that their children might see how foolish and contemptible men looked in that state. Plato says that the vice of intemperance was effectually rooted out of the republic of Sparta, and that if any man found another in a state of intoxication, he was, under the stern laws of Lycurgus, brought to punishment, and even though he might plead that the feast of Bacchus ought to excuse him, his defense availed him nothing. A law was enacted punishing with death any man who should drink wine, unless by a physician's prescription. The Massilians had a law that no woman should drink anything stronger than water. Pittacus made a law that he who when drunk committed any offense against the laws, should suffer a double punishment, one for the crime itself, and the other for the intoxication which prompted him to commit it; and the law was applauded by Plato, Aristotle and Plutarch, as the height of wisdom.

The evils of intemperance which pervaded ancient Rome necessitated the enactment of stringent laws by those in authority. Pliny is authority for the statement that women in Rome were forbidden to drink wine in the year 650 B. C., and that the penalty for disobedience was death, the same as the penalty for adultery; and the reason given was that wine was a certain incitement to lewdness. It was the usage for women to salute all their male relatives with a kiss, in order that it might be ascertained if they had been indulging in intoxicants. The Roman censor had general supervision of the morals of the

people, and was empowered to punish, and did punish drunkenness with excessive severity. He was required to be a man of rigidly abstemious habits, and was liable to expulsion from the order for a single violation of the laws relative to sobriety. These censors turned drunken members out of the Senate without the least mercy, and branded them with perpetual infamy. They were allowed no place of honor or profit in the government.

The epistles of the New Testament bear evidence that intemperance prevailed to an alarming extent in the Gentile world, especially in the cities of Greece and Rome, where the first efforts were made to establish the Christian religion. The drinking habits of the people greatly hindered the progress of the Gospel, and the early converts were frequently warned to avoid drunkenness, and not to keep company with drunkards, and to remember "that no drunkards can inherit the kingdom of God."

But to extend our historical researches to all the nations of the earth, ancient and modern, that have attempted to deal with this subject, would carry this paper into a field that was not within my purpose, and my only apology for looking into the darkness of the past is to show that we of the present time are struggling to overcome evil in a form that has manifested itself from the earliest times, and the remedies we invoke are essentially the same as those directed against the traffic in all times.

Any one who is curious to trace the history of this traffic in all of its ramifications will find it has been present to curse the people of every nation, ancient and modern, and is a problem, perhaps no nearer solution now than it was four thousand years ago. Perhaps it is not strictly true to charge all the evils that *appear* to flow from the immoderate use of intoxicants, to the intoxicants themselves. May it not be rather that undue indulgence so weakens the power of self-control and restraint as to let loose much of the evil in our human natures to prey upon society, without the governing and restraining influences of judgment, discretion and propriety. Again, may not the evils supposed to result from the improper use of intoxicants be but so many manifestations of the evil that is in the world, and as a necessary adjunct to human existence? Would the banishment of all intoxicants banish evil from the world? By no means; the same evil would exist with the same vicious tendencies; and it is fair to assume it would manifest itself in ways perhaps equally injurious to society. But these are speculations that we can hardly enter upon, however inviting the field. We are to deal more

particularly with the evils, if they be evils, of intemperance as they exist at the present time.

Statistics and the facts of history furnish undoubted proof that very much of that which injuriously affects the public health, the public morals and the well-being of society can be traced to the immoderate use of intoxicants, certainly as an "exciting cause" and active agent. The present condition of the human family is the realization of all the good and bad of the ages past. While the liquor traffic has played an important part in producing the equilibrium of rights and duties as they exist at the present time in connection with organized society, it is but one of the many factors entering into the problem of human progress. Words can never describe how much this traffic has interfered with home-life, its peace, its comforts, its happiness, nor will statistics disclose how great a factor this habit has been in all ages in bringing want and poverty upon its numberless victims, making them burdens upon society; nor the numerous contributions it has made to the criminal classes, and those who are indifferent aud opposed to the well-being of society; nor how far it has crippled and lowered the standard of public virtue and morals; nor to what extent it has operated to undermine the health and shorten the lives of its many victims, and those who, by the inexorable law of heredity, are made to suffer from its effects in one way or another even to the third and fourth generation. It will be sufficient for my purpose to assume as established what every well-informed person is cognizant of, that the inordinate use of intoxicants affects more generally and seriously the public health, the public morals and the well-being of society than any other active agent with which society has to deal.

Does the liquor traffic then present a case for the intervention of the State? Necessarily we must consider fundamentals. Broadly put, governments are instituted to protect and secure the just rights of all, to secure happiness and promote the general welfare. Anything that by encouragement or repression aims at or secures those objects is within the province of government. Ours is a government of the people, where every man is a part of sovereignty, founded upon the idea that men are capable of governing themselves, which means liberty of thought and action in the broadest sense compatible with public safety and the well-being of society. Necessarily every member of organized society as it exists here, in order that he may enjoy the greatest liberty himself, agrees to surrender so much of his own individual freedom of thought and action as may be necessary to secure the enjoyment of the same rights on

the part of every other member of that society. There is no such thing as absolute liberty, when considered with reference to the rights and duties of the citizen, because he must always enjoy his rights with careful regard that he shall not interfere with any of the rights of his neighbor. Necessarily, therefore, the citizen who would be freest, who would enjoy the largest measure of human happiness, as a member of organized society, must surrender to his neighbor and to the State so much of his natural rights as may be necessary and proper for the protection of the equal rights of all his associates.

All power emanates from the people, and, broadly put, the will of the majority is the supreme law of the land. Where, then, is the line upon which government may interfere and control and regulate the conduct, the business and the social relations of men? I answer: Government has to deal with the overt act, either to prevent or punish, and the government, as such, has no right to deal with the conscience, the motive or the intention, except so far as these are manifested by overt acts performed or likely to be performed. And this leads us, naturally, to a brief consideration of one of the favorite arguments indulged in by a large class of temperance reformers, who are earnest and sincere, and yet whose chief error, as it seems to me, arises in assuming that it is the duty of government to deal with the consciences of men. On principle this cannot be true, except in the qualified sense stated. I conceive that the persistent disregard of fundamental propositions, and the illogical deductions therefrom, has produced and is producing very much of the inefficient work aimed at the evil under consideration. The time is forever passed when the judgment of enlightened civilization will recognize the right of government to interfere with or control or coerce the conscience, except so far as to restrain or control or punish overt acts, which may, perhaps, appropriately be said to be "outward and visible signs" of a lack of inward grace. The moral law, of course, deals with motives; but human law cannot until the motive takes form in action, real or intended. A man may form the wicked design in his heart to commit murder or any other serious offense, and thus be amenable to the moral law, yet until there is some evidence that he contemplates carrying that intention into effect, or until he acts, human law cannot be invoked.

The argument that, to sell intoxicating liquors is a sin, and to license the sale is to legalize a wrong, and, therefore, that all license laws are sinful and wrong, and ought, therefore, to be opposed, is both unsound and illogical when applied to the State. License is prohibi-

tion, to all except the licensees, and as to them it is regulation. In the absence of all governmental regulation it is now and always has been perfectly legal and legitimate for persons to buy and sell intoxicating liquors of all kinds with as much freedom as they would any other commodity. But, in another aspect, the manufacture, sale and use of intoxicating liquors of all kinds may be innocent, beneficial and praiseworthy, or they may be dangerous to society and highly injurious. Where, then, is the wrong in a legal sense? Certainly not in the manufacture or the sale or the reasonable use thereof, as such, but *entirely* in the *improper use* which impairs or tends to impair the usefulness of the citizen, disturbs or tends to disturb the peace and quiet and well-being of society. We conceive this to be a reasonable as well as a practical view of the question, which is in accord with the proper legal attitude which government may assume with reference to the traffic. With us the proper sphere of each is defined by the Constitution of the United States and the Constitutions of the several States. It is now generally admitted by courts and jurists that the legislative branch of government is supreme as to the needs and requirements of the people, and as to all matters proper for legislative enactment, except in those particulars where the Constitution has limited or withheld the right to legislate.

The main guarantee of private rights against unjust legislation is found in that memorable clause in the Bill of Rights that "no person shall be deprived of life, liberty or property without due process of law, nor shall private property be taken for public use without just compensation," which is contained in the Constitution of our own State, and the clause in the Constitution of the United States, that "no State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States, nor shall any State deprive any person of life, liberty or property, without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws." I might multiply authorities to the same effect, but it is a question so well settled as not to permit of controversy, and, except under the circumstances which I shall have occasion to consider later on, the common law recognized the right in any individual to manufacture, buy, sell or use intoxicating liquors with the same freedom as any other kind of property.

In 1855 the New York Legislature passed a prohibitory liquor law. But does a law which effectually prevents and prohibits the sale or use of property — of intoxicating liquors, if you please — fall within the inhibition of the Constitution? Perhaps I can do no better than

to present to you some of the opinions and conclusions of eminent jurists bearing upon that question. The first question naturally arising under this branch of the discussion will be, Do intoxicating liquors constitute property within the meaning of the law, as establishing the proposition that a law which does prevent the sale or use of property is equivalent to depriving the owner of his property without due process of law?

In the case of *Wynehamer* v. *People*, 13 N. Y. 378, which involved its constitutionality, Judge Comstock, speaking for the majority of the court, said: "It is, I believe, universally admitted that when this law was passed intoxicating liquors, to be used as a beverage, were *property* in the most absolute and unqualified sense of the term, and, as such, as much entitled to the protection of the Constitution as lands, houses or chattels of any description. From the earliest ages they have been produced and consumed as a beverage, and have constituted an article of great importance in the commerce of the world. In this country the right of property in them was never, so far as I know, for an instant questioned. In this State they were bought and sold like other property; they were seized and sold upon legal process, for the payment of debts; they were, like other goods, the subject of actions at law; and when the owner died their value constituted a fund for the benefit of his creditors, or went to his children and kindred, according to law or the will of the deceased. They entered largely into the foreign and internal commerce of the State, and when subjected to the operation of this statute, many millions in value were invested in them. In short, I do not understand it to be denied that they were *property* in just as high a sense as any other possession which a citizen can acquire. Judicial authority might be cited, but this does not seem necessary where there is scarcely a controversy." Again, he says: "The foundation of property is not in philosophic or scientific speculations, nor even in the suggestions of benevolence or philanthropy. It is a simple and intelligible proposition admitting, in the nature of the case, of no qualification, that that is property which the law of the land recognizes as such. It is, in short, an institution of law, and not a result of speculations in science, in morals or economy."

It would be easy to multiply authorities, but that is not necessary.

In this connection I shall assume, what is undoubtedly true on authority, that spirituous liquors are property, and that they may lawfully be manufactured, sold and used, except so far as their manufacture and use may be enjoined by the State, as I shall have occasion

to show later on. Starting, then, with the fact that intoxicating liquors are recognized by the law as property, we are first confronted with the question, does a law which effectually prevents or prohibits the sale or use of property fall within the inhibition of the Constitution, in that it deprives a person of property, without due process of law, without just compensation?

In the case above referred to, Judge Comstock observes: "Property, if protected by the Constitution from such legislation as that we are now considering, is protected because it is property innocently acquired under existing laws, and not upon any theory which even so much as opens the question of its utility. If intoxicating liquors are property, the Constitution does not permit a legislative estimate to be made of its usefulness, with a view to its destruction. In a word, that which belongs to the citizen in the sense of property, and as such has to him a commercial value, cannot be pronounced worthless or pernicious, and so destroyed or deprived of its essential attributes. Sir William Blackstone, who wrote of the laws of England nearly a century ago, said: 'So great is the regard of the law for private property, that it will not authorize the least violation of it, no, not even for the general good of the whole community.'"

We can form no notion of property which does not include the essential characteristics and attributes with which it is clothed by the laws of society. In a state of nature property did not exist at all. "Every man might then take to his use what he pleased, and retain it if he had sufficient power; but when men entered society, and industry, arts and sciences were introduced, property was gained by various means, for the securing whereof proper laws were ordained." (Tomlin's Law Dict., Property; 2 Bl. Com. 34.) Material objects, therefore, are property in the true sense, because they are impressed by the laws and usages of society with certain qualities, among which are, fundamentally, the right of the occupant or owner to use and enjoy them *exclusively*, and his absolute power *to sell and dispose* of them; and as property consists in the artificial impression of these qualities upon material things, so, whatever removes the impression destroys the notion of property, although the things themselves may remain physically untouched.

Nor can I find any definition of property which does not include the power of disposition and sale, as well as the right of private use and enjoyment. Thus Blackstone says (1 Com. 138): "The third absolute right of every Englishman is that of property, which consists *in the free use, enjoyment and disposal* of all his acquisitions,

without any control or diminution, *save* only by the laws of the land." Chancellor Kent says (2 Com. 320): "The exclusive right of using and transferring property follows as a natural consequence from the perception and admission of the right itself." And again (p. 326): "The power of alienation of property is a necessary incident to the right, and was dictated by mutual convenience and mutual wants." By another author, property is defined as an "exclusive right to things, containing not only a right to use those things, but a right to dispose of them, either by exchanging them for other things, or giving them away to another person without consideration, or even throwing them away."

Judge Comstock, in the case cited, further said: "When a law annihilates the value of property, and strips it of its attributes, by which alone it is distinguished as property, the owner is deprived of it according to the plainest interpretation and certainly within the spirit of a constitutional provision intended expressly to shield private rights from the exercise of arbitrary power." Judge Selden, in the same case, says: "A man may be deprived of his property in a chattel, therefore, without its being seized or physically destroyed, or taken from his possession. Whatever subverts his rights in regard to it annihilates his property in it. It follows that a law which should provide in regard to any article in which a right of property is recognized, that it should neither be sold or used * * * would fall directly within the letter of the constitutional inhibition." Judge Hubbard, in the same case, says: "But the abolition of all rights of sale in the statute is equivalent to and is a substantial deprivation of the owner of his property. The right of sale is of the very essence of property in any article of merchandise; it is its chief characteristic; take away its vendible quality and the article is practically destroyed."

Andrews, J., in *Bertholf* v. *O'Reilly*, 74 N. Y. 515, says: "The main guaranty of private rights against unjust legislation is found in that memorable clause in the Bill of Rights, that no person shall 'be deprived of life, liberty or property without due process of law.' (Const., art. 1, § 6.) This guaranty is not construed in any narrow or technical sense. The right to life may be invaded without its destruction. One may be deprived of his liberty in a constitutional sense without putting his person in confinement. Property may be taken without manual interference therewith or its physical destruction. The right to life includes the right of the individual to his body in its completeness, and without dismemberment; the right to liberty, the right to exercise

his faculties and to follow a lawful avocation for the support of life; the right of property, the right to acquire, possess and enjoy it in any way consistent with the equal rights of others, and the just exactions and demands of the State." In *People* v. *Otis*, 90 N. Y. 48, the same judge says: "Depriving an owner of property of one of its attributes is depriving him of his property within the constitutional provision."

Miller, J., in *Pumpelly* v. *Green Bay Co.*, 13 Wall. 177, says: "There may be such serious interruption to the common and necessary use of property as will be equivalent to a taking within the meaning of the Constitution." Earl, J., *In re Jacobs*, 98 N. Y. 98–105, says: "The constitutional guaranty that no person shall be deprived of his property without due process of law may be violated without the physical taking of property for public or private use. Property may be destroyed or its value may be annihilated; it is owned and kept for some useful purpose and it has no value unless it can be used. Its capability for enjoyment and adaptability to some use are essential characteristics and attributes, without which property cannot be conceived; and hence any law which destroys it or its value, or takes away any of its essential attributes, deprives the owner of his property." Rapallo, J., in *People* v. *Marx*, 99 N. Y. 377–386, says: "No proposition is now more firmly settled than that it is one of the fundamental rights and privileges of every American citizen to adopt and follow such lawful industrial pursuit, not injurious to the community, as he may see fit."

You will readily perceive that the "liberty" of the Constitution is not limited to immunity from actual imprisonment, nor is the "property" clause thereof to the physical destruction or annihilation of the substance. These are conclusions now so perfectly well settled by the current of judicial authority, as to remove them from the subject of controversy.

Our next inquiry arises upon the effect of the qualifying words in this constitutional provision, "no person shall be deprived of life, liberty or property *without due process of law.*" Conversely, if by "due course of law," it be necessary or proper to deprive a person of his life, or of his liberty, or of his property, then either may be sacrificed. In the case of *Westervelt* v. *Gregg*, 12 N. Y. 209, our Court of Appeals held: "Due process of law undoubtedly means in the due course of legal proceedings, according to those rules and forms which have been established for the protection of private rights. Such an act as the Legislature may, in the uncontrolled exercise of its power, think

fit to pass, is in no sense the process of law designated by the Constitution."

In the case of *Bertholf* v. *O'Reilly*, 74 N. Y. 519, Judge Andrews, speaking for the same court, said: "They (the words 'due process of law') are held, under the liberal interpretation given them, to protect the life, liberty and property of the citizen against acts of mere arbitrary persons in any department of the government. These are the fundamental civil rights for the security of which society is organized, and all acts of legislation which contravene them are within the prohibition of the constitutional guaranty." In *Stuart* v. *Palmer*, 74 N. Y. 190, Judge Earl said: "It is a rule founded on the first principles of natural justice, older than written constitutions, that a citizen shall not be deprived of his life, liberty or property without an opportunity to be heard in defense of his rights, and the constitutional provision that no person shall be deprived of these 'without due process of law,' has its foundation in this rule. This provision is the most important guaranty of personal rights to be found in the Federal or State Constitutions. It is a limitation upon arbitrary power, and is a guaranty against arbitrary legislation. No citizen shall arbitrarily be deprived of his life, liberty or property. This the Legislature cannot do, nor authorize to be done. 'Due process of law' is not confined to judicial proceedings, but extends to every case which may deprive a citizen of life, liberty or property, whether the proceeding be judicial, administrative or executive in its nature. This great guaranty is always and everywhere present to protect the citizen against arbitrary interference with these sacred rights." "'Due process of law,' in each particular case, means," says Judge Cooley, "such an exertion of the powers of government as the settled maxims of the law sanction, and under such safeguards for the protection of individual rights as those maxims prescribe for the class of cases to which the one in question belongs." In *Murray's Lessee* v. *Hoboken Co.*, 18 How. Rep. (U. S.) 272, the Supreme Court of the United States held that the provision as to "due process of law," was a restraint on the legislative as well as the executive and judicial powers of the government.

These sacred rights of life, of liberty, of property, are guarded with a jealous care, and every invasion of these guaranties will be steadfastly resisted by every impulse of natural justice, by every lover of liberty and justice, and will never again be overridden by arbitrary power, whether legislative or executive, so long as an upright and intelligent judiciary is permitted to interpose and declare the judgment of en-

lightened civilization thereon. But neither the right to life nor to liberty nor to property, measured by the relations necessarily existing between the State and the citizen, is absolute, for above all constitutions and laws stands the State, the embodiment of all the power of all the people, clothed with an absolute authority, necessarily resulting from the existence of the State, to guard and protect the public health, the public morals and to promote the general well-being of society. These are powers of State that are not restricted by constitutions or laws. They involve the right of the State to protect itself from destruction, to perpetuate its own existence.

In the case of *Stone* v. *Mississippi*, 101 U. S. 816, where the constitutional provision, prohibiting the State from making any law impairing the obligations of contracts, was invoked against the repeal by the State of a charter granted to a private corporation to conduct a lottery, for which that corporation paid to the State a valuable consideration in money, the United States Supreme Court said: "No Legislature can bargain away the public health or the public morals; the people themselves cannot do it, much less their servants. Government is organized with a view to their preservation, and cannot divest itself of the power to provide for them." In *Butchers' Union Co.* v. *Crescent City Co.*, 111 U. S. 751, the same court held that the State could not, by any contract, limit the exercise of her power to the prejudice of the public health and the public morals.

Again, in *New Orleans Gas Co.* v. *Louisiana Light Co.*, 115 U. S. 650, 672, the same court said: "The constitutional prohibition upon State laws impairing the obligation of contracts does not restrict the power of the State to protect the public health, the public morals or the public safety, as the one or the other may be involved in the execution of such contracts. Rights and privileges arising from contracts with the State are subject to regulations for the protection of the public health, the public morals and the public safety in the same sense and to the same extent as are all contracts and all property, whether owned by natural persons or corporations." In the Kansas appeal cases, the same court said: "The principle, that no person shall be deprived of life, liberty or property without due process of law was embodied, in substance, in the Constitutions of nearly all, if not all, of the States at the time of the adoption of the fourteenth amendment, and it has never been regarded as incompatible with the principle, equally vital, because essential to the peace and safety of society, that all property in this country is held under the

implied obligation that the owner's use of it shall not be injurious to the community."

Here, then, are great powers possessed by the State which never have been, and, in the nature of things, cannot be surrendered by the people or restrained by constitutions or laws. These powers are known in the law as the police powers of the State. It is by the exercise of these powers that the State protects itself in the prevention and punishment of crime, in guarding the public morals, in preserving the public health, in securing the safety and promoting the general well-being of society, even though in attaining those objects it be necessary to sacrifice life, liberty or property.

After the adoption of the fourteenth amendment to the Constitution of the United States, it was claimed that this had the effect to take from the States those powers of police which had been reserved to the States when the National Constitution was adopted. The United States Supreme Court had occasion to consider that question in the case of *Barbier* v. *Connolly*, 113 U. S. 31, and said: "But neither the amendment—broad and comprehensive as it is—nor any other amendment, was designed to interfere with the power of the State, sometimes termed its police power, to prescribe regulations to promote the health, peace, morals, education and good order of the people, and to legislate so as to increase the industries of the State, develop its resources, and add to its wealth and prosperity."

Speaking in general terms, the powers of the English Parliament are absolute and binding. Parliament is said to be omnipotent, because its powers are not restricted, defined or prescribed by any written constitution. It enacts such laws as it pleases on all sorts of questions, affecting all sorts and conditions of men, and the English courts are never called upon to test the constitutionality of an act of Parliament. But, with us, perhaps, there is no constitutional question that has been so persistently pressed upon the consideration of our higher courts, as that class of legislation which seeks to invade the rights of liberty and property. And the debatable line has been, was the legislation attempted within the police powers of the State, so called, or was it an invasion of constitutional guaranties under the guise or pretense of preserving the public health or morals, or promoting the general welfare.

In re Jacobs, 98 N. Y. 98, Judge Earl, of our own Court of Appeals, said: "Under the mere guise of police regulations, personal rights and private property cannot be arbitrarily invaded, and the determination of the Legislature is not final or conclusive. If it passes

an act ostensibly for the public health, and thereby destroys or takes away the property of the citizen, or interferes with his personal liberty, then it is for the courts to scrutinize the act and see whether it really relates to and is convenient and appropriate to promote the public health. It matters not that the Legislature may, in the title to the act or in the body, declare that it is intended for the improvement of the public health. Such a declaration does not conclude the courts, and they must yet determine the fact declared and enforce the supreme law." And again: "A law enacted in the exercise of the police power must in fact be a police law. If it be a law for the promotion of the public health it must be a health law."

The Supreme Court of Illinois has also said: "As a general proposition, it may be stated it is in the province of the law-making power to determine whether the exigencies exist calling into exercise this (police) power. What are the subjects of its exercise is clearly a judicial question." *Town of Lake View* v. *Rose Hill Co.*, 70 Ill. 191.

But who shall decide, and by what authority shall it be determined, whether the manufacture, sale or use of intoxicating liquors as a beverage is injurious to the public health or detrimental to the public morals or injuriously affects the well-being of society? As we have seen, these belong to the large powers of State, and are not circumscribed even by constitutions, and from which the State itself cannot, even if it would, shrink. So long as the State exists it must meet and decide those questions. Therefore, power to decide must be vested somewhere, or society is left at the mercy of those, who, regarding only their own appetites or passions, are willing to imperil the peace and comfort and happiness and general well-being of all, and under our form of government that power is vested solely and exclusively in the legislative branch of the government.

In the Kansas appeals, above referred to, the United States Supreme Court reiterated this proposition which has been so well settled by a long current of judicial authority as to remove that question from the subject of debate. It said: "Under our system that power (the police) is lodged with the legislative branch of the government. It belongs to that department to exert what are known as the police powers of the State, and to determine, primarily, what measures are appropriate or needful for the protection of the public morals, the public health or the public safety. It does not at all follow that every statute enacted ostensibly for the promotion of these ends is to be accepted as a legitimate exertion of the police powers of the State. There are, of necessity, limits beyond which legis-

lation cannot rightfully go. While every posssible presumption is to be indulged in favor of the validity of a statute, the courts must obey the Constitution rather than the law-making department of government, and must, upon their own responsibility, determine whether, in any particular case, these limits have been passed. And again, the courts are not bound by mere forms, nor are they to be misled by mere pretenses. They are at liberty — indeed, are under a solemn duty — to look at the substance of things, whenever they enter upon the inquiry whether the Legislature has transcended the limits of its authority. If, therefore, a statute purporting to have been enacted to protect the public health, the public morals or the public safety has no real or substantial relation to those objects, or is a palpable invasion of rights secured by the fundamental law, it is the duty of the courts to so adjndge, and thereby give effect to the Constitution."

Here, then, are the duties, and here the limitation of legislative power. So long as the legislative enactment fairly embraces those matters which are within the police powers of the State, if the legislation is aimed to protect and preserve the public health, the public morals or the public safety, or to promote the general well-being of society, it must, in the nature of things, be the supreme authority with reference thereto, and is binding upon all. In what manner or to what extent the legislative branch of the government will exercise this power becomes at once a matter of legislative discretion and judgment. For, as was said by Chief Justice Marshall (*Brown* v. *State of Maryland*, 12 Wheat. 419): "Questions of power do not depend upon the degree to which it may be exercised; if it may be exercised at all, it must be exercised at the will of those in whose hands it is placed."

Whatever differences of opinion may have been expressed by the courts in solving this great constitutional question, I believe it may be safely affirmed that the current of judicial authority in all the States, as well as that of the United States Supreme Court, is to the effect that if the legislative branch of the government, in the exercise of its police powers, should determine that the manufacture, or sale, or use, or the keeping for use, as a beverage, of intoxicating liquors, was detrimental to the public health, or the public morals, or was injurious to society, then it could adopt any restrictive measure it might deem necessary. It could declare such liquors forfeited, and direct their destruction. It could declare such manufacturing establishments public nuisances, and direct their abatement as such. It could positively prohibit the manufacture, sale or use of intoxicating liquors as a beverage, or it could license with whatever strictness it might

see fit, or regulate with whatever care it might choose, either the manufacture, sale or use thereof as a beverage.

In making this broad statement, I am not unmindful of the fact that there is very high judicial authority for holding that although given legislation may be within the exercise of the police powers of the State, yet that property existing at and before such legislation, either in the form of invested capital, in manufacturing establishments, and the like, or in spirituous liquors on hand, cannot be interfered with so far as either to prevent the sale or use thereof, or otherwise interfere with its enjoyment, so as, in fact, to destroy its value and essential attributes of property.

Our own Court of Appeals in the *Wynehamer Case,* in passing upon the constitutionality of the prohibitory measures of the law of 1855, held these propositions:

"1. The prohibitory act in its operation upon property in intoxicating liquors existing in the hands of any person within this State when the act took effect, is a violation of the provision in the Constitution of this State, which declares that no person shall be deprived of life, liberty or property, without due process of law.

"That the various provisions, prohibitions and penalties contained in the act do substantially destroy the property in such liquors, in violation of the terms and spirit of the constitutional provision.

"2. That inasmuch as the act does not discriminate between such liquors existing when it took effect as a law, and such as might thereafter be acquired by importation or manufacture, and does not countenance or warrant any defense based upon the distinction referred to, it cannot be sustained in respect to any liquor, whether existing at the time the act took effect or acquired subsequently," etc.

There was a very strong dissent in that case, and I cannot believe but what, in the light of the later decisions involving the exercise of these police powers, our courts would sustain legislation of that kind. For example, our present Court of Appeals has held that a law prohibiting the sale or exchange, or exposure for sale, of milk shown to contain more than eighty-eight per cent of water or fluids, or less than twelve per cent of milk solids, and not less than three per cent of fat, or any articles of food made from the same, or from cream from the same, was a constitutional exercise by the Legislature of its police powers; and yet in the case where the question was raised, the undisputed evidence was that the milk exposed for sale was only a small fraction below the standard, was drawn from healthy cows, properly fed and kept, into which no substance had been

placed, and was really, and in truth, a natural and healthy product And yet, because the Legislature had *decided* that milk below this arbitrary standard was, in its judgment, injurious and detrimental to the public health, therefore, the court declined to interfere, and by sustaining the legislation, virtually upheld the proposition, as was claimed by the parties in that case, that the Legislature had reversed the experience of mankind in all past ages, and that it was an attempt by legislative enactments to reverse the processes of nature.

In the *License Cases*, 5 How. 504, Chief Justice Taney said: "If any State deems the retail and internal traffic in ardent spirits injurious to its citizens, and calculated to produce idleness, vice or debauchery, I see nothing in the Constitution of the United States to prevent it from regulating and restraining the traffic, or from prohibiting it altogether, if it thinks proper." In *Beer Co.* v. *Massachusetts*, 97 U. S. 33, it was said: "That as a measure of police regulation, looking to the preservation of public morals, a State law prohibiting the manufacture and sale of intoxicating liquors is not repugnant to any clause of the Constitution of the United States."

The most recent adjudication involving the right of the State to prohibit the manufacture, sale or use of intoxicating liquors for other than medicinal, scientific and mechanical purposes, was made by the United States Supreme Court in *Mugler* v. *Kansas*, 123 U. S. 623. This was one of several cases involving the validity of legislative enactments under the State Constitution, which had the effect of prohibiting the manufacture and sale within that State of intoxicating liquors, except for medical, scientific and mechanical purposes. It appeared that some of the persons proceeded against had large capital invested in establishments especially constructed for the manufacture of beer at the time these enactments took effect; and that the buildings and machinery constituting these breweries would be of little value if not used for the purpose of manufacturing beer, and would, therefore, be a practical destruction of their property. The general question in those cases being whether the statutes of Kansas conflicted with that clause in the fourteenth amendment of the Constitution of the United States, which provides that "no State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States, nor shall any State deprive any person of life, liberty or property, without due process of law." The court held that such legislation was valid, and did not invade any constitutional right. Mr. Justice Harlan, speaking for the court, said: "That legislation by a State prohibiting the manufacture

within her limits of intoxicating liquors, to be there sold or bartered for general use as a beverage, does not necessarily infringe any right, privilege or immunity secured by the Constitution of the United States, is made clear by the decisions of this court.

"Again, there is no justification for holding that the State, under the guise merely of police regulations, is here aiming to deprive the citizen of his constitutional rights; for we cannot shut out of view the fact, within the knowledge of all, that the public health, the public morals and the public safety may be endangered by the general use of intoxicating drinks; nor the fact, established by statistics accessible to every one, that the idleness, disorder, pauperism and crime existing in the country are, in some degree at least, traceable to this evil. If, therefore, a State deems the absolute prohibition of the manufacture and sale, within her limits, of intoxicating liquors for other than medical, scientific and manufacturing purposes, to be necessary to the peace and security of society, the courts cannot, without usurping legislative functions, override the will of the people as thus expressed by their chosen representatives. They have nothing to do with the mere policy of legislation. Indeed, it is a fundamental principle in our institutions, indispensable to the preservation of public liberty, that one of the separate departments of government shall not usurp powers committed by the Constitution to another department. And so, if, in the judgment of the Legislature, the manufacture of intoxicating liquors for the *maker's own use*, as a beverage, would tend to cripple, if it did not defeat, the effort to guard the community against the evils attending the excessive use of such liquors, it is not for the courts, upon *their* views as to what is best and safest for the community, to disregard the legislative determination of that question. So far from such a regulation having no relation to the general end sought to be accomplished, the entire scheme of prohibition, as embodied in the Constitution and laws of Kansas, might fail, if the right of each citizen to manufacture intoxicating liquors for his own use as a beverage were recognized.

"Such a right does not inhere in citizenship. Nor can it be said that government interferes with or impairs any one's constitutional rights of liberty or of property when it determines that the manufacture and sale of intoxicating drinks, for general or individual use, as a beverage, are, or may become, hurtful to society, and constitute, therefore, a business in which no one may lawfully engage. Those rights are best secured, in our government, by the observance upon the part of all, of such regulations as are established by competent

authority to promote the common good. No one may rightfully do that which the law-making power, upon reasonable grounds, declares to be prejudicial to the general welfare."

And again: "A prohibition simply upon the use of property for purposes that are declared, by valid legislation, to be injurious to the health, morals or safety of the community cannot, in any just sense, be deemed a taking or an appropriation of property for the public benefit. Such legislation does not disturb the owner in the control or use of his property for lawful purposes, nor restrict his right to dispose of it, but it is only a declaration by the State that its use by any one for certain *forbidden purposes*, is prejudicial to the public interests. Nor can legislation of that character come within the fourteenth amendment, in any case, unless it is apparent that its *real object is not* to protect the community, or to promote the general well-being, but, under the *guise of police regulation*, to deprive the owner of his liberty and property, without due process of law.

"The power which the States have of prohibiting *such use by individuals* of their property as will be prejudicial to the health, the morals or the safety of the public, is not — and, consistently with the existence and safety of organized society, cannot be — burdened with the condition that the State must *compensate* such individual owners for pecuniary losses they may sustain by reason of their not being permitted, by a noxious use of their property, to inflict injury upon the community. The exercise of the police power by the destruction of property, which is itself a public nuisance, or the prohibition of its use in a particular way, whereby its value becomes depreciated, is very different from taking property for public use, or from depriving a person of his property without due process of law. In the one case, a nuisance only is abated, in the other, unoffending property is taken **away from an innocent owner.**

"It is true, that, when the defendants in these cases purchased or erected their breweries, the laws of the State did not forbid the manufacture of intoxicating liquors. But the State did not thereby give any assurance, or come under an obligation, that its legislation upon that subject would remain unchanged. Indeed, the supervision of the public health and the public morals is a governmental power, 'continuing in its nature,' 'to be dealt with as the special exigencies of the moment may require,' and 'for this purpose, the largest legislative discretion is allowed, and the discretion cannot be parted with any **more than the power itself.**'

"If the public safety or the public morals require the discontinuance of any manufacture or traffic, the hand of the Legislature cannot be stayed from providing for its discontinuance by any incidental inconvenience which individuals or corporations may suffer. The State having authority to prohibit the manufacture and sale of intoxicating liquors for other than medical, scientific and mechanical purposes, we do not doubt her power to declare that any place kept and maintained for the illegal manufacture and sale of such liquors, shall be deemed a common nuisance, and be abated, and, at the same time, to provide for the indictment and trial of the offender."

It would be an easy matter to multiply authorities, but I fear that I have already trespassed too much upon your time, in treating, with some detail, the current of judicial thought upon these questions. Assuming that the right of the State is now fairly established to interfere by such legislative enactments as it may think appropriate, either to prohibit, or restrict, or license the traffic, we turn briefly to the political aspects of the question. It is not, properly, within the scope of this discussion to speak of the relative merits of proposed methods to correct the evils resulting from this traffic. Enough has been said to show that the subject-matter must be treated at the hands of the legislative branch of the State. It is a subject that cannot be treated from an ideal standpoint, for many and obvious reasons, among them that the citizen must be left to enjoy his own rights and property, without interference, beyond that which may be necessary to protect and secure the equal rights of all others; and that in determining the scope or manner in which he shall enjoy his rights, so far as the question under discussion is concerned, regard must be had to the will of the majority, as expressed by legislative enactments. With us public opinion, that indescribable force that seems to direct the actions of men in many of the public and private concerns of life, is a factor too important to ignore. Aye, it is the most important factor in working out a solution of this or any other great, far-reaching question affecting the common welfare. "I know one," said Talleyrand, "who is wiser than Voltaire, and has more understanding than Napoleon and all his ministers, who ever were, are or will be, and this one is Public Opinion."

We must remember that the man who believes, and acts upon the belief, that it is not wrong or injurious to indulge moderately or immoderately in intoxicating liquors has the same right to exert his influence upon the public mind as the one who believes it to be the greatest curse of the age. Here, then, are two forces struggling for

supremacy, in shaping and controlling that all-powerful agent — public opinion. In my opinion, one of the greatest obstacles to a practical and successful solution of this question is found in the fact that among the so-called better class of the community there is little, if any, cohesive power, so to speak, in regard to public or political questions; while those who make no pretense to an excess of public or private virtue stand together as an invincible army, always able, without serious effort, to resist the assaults of the army of reformers who are constantly dissipating their powers in trying to settle strifes within their own ranks, as to how best they can eliminate or overcome an evil against which they all decry.

The evil exists to an alarming extent with no legal restraints. To illustrate, let us suppose a case: Here is a company of ten men, four of whom will not permit any regulation, restriction or interference with the traffic — no sumptuary legislation. They believe in personal liberty in the fullest sense. The other six are real public benefactors, and conscientious and earnest temperance reformers, who greatly desire to have the world relieved from this evil. Two of them believe in the adoption of extreme prohibitory measures. They say it is wrong and sinful in itself. Nothing must be done—nothing shall be done—except to blot it out of existence. No license, no regulation, nothing but destruction. Two others just as conscientiously believe that, in dealing with human nature as it is, with facts as they are, high license, with strong restrictive provisions, will do more to minimize the evils resulting from the traffic than any other course. They believe in the personal liberty that is regulated by law. The other two, imbued with a desire to benefit their fellow-men, conscientiously believe that the proper solution of the problem lies in moral suasion, in developing a strong temperance sentiment, in elevating the public morals, and that local option which shall enable the majority sentiment, as embraced by the people within a given area, to decide from time to time whether within that area intoxicating liquors should be manufactured, sold or used as a beverage. The question must be solved by these ten persons, in such way as that it shall be binding upon all. It is apparent that so long as the ten adhere to their convictions the question is unsolved, and those who desire personal liberty, although in the minority, are gratified, while the other six, in parties of two, each willing the others shall yield, are trying to convince each other of the wisdom and advantage of their methods and the short-comings and impracticability of that of the others.

This illustrates in a small way the practical difficulty in trying to solve this question through political agencies. I believe there are more people in this State and in these United States who belong to the law and order side of society than otherwise, and yet without concert of action they are powerless to accomplish any thing substantial, any thing beyond the legitimate results of agitation, which I concede are great while the minority have their own way. This matter never will be solved if treated as a political question, until the friends of temperance, embracing all shades of opinion, looking to the elimination or minimizing of the evils resulting from the traffic, shall so far modify their extreme views as that their associates, by yielding in like manner, will be able to stand as an army of earnest workers, seeking to benefit their fellow-men. The friends of temperance here, although clearly in the majority, fail to accomplish any result, and yet by the application of a little concession on the part of all, there might be a middle ground upon which all could unite and thus make a real and substantial advance, laboring in a common cause free from dissensions in their own ranks, that shall retard or interfere with the accomplishment of the desire of all.

Political parties are but aggregations of men, who act together upon public matters because they agree in the main upon a given line of policy. Individual differences sink into obscurity, extremes are avoided, the middle course is adopted and all work together for a common result. Practically, then, the political aspect of this question is tested in bringing to an expression by legislative enactment the best reason and conscience of the people. An eminent scholar has said· "The strain of civil liberty is in the demand which it makes on the whole mass of the people for perpetual activity of reason and conscience to re-examine rights and duties, and to readjust their equilibrium. * * * The equilibrium of rights and duties constitutes the terms on which the struggle for existence is carried on in a given society after the reason and conscience of the community have pronounced judgment on those terms. The very highest conception of the State is that it is an organization for bringing that judgment to an expression in the Constitution and laws. A State, therefore, is good, bad or indifferent, according to the directness and correctness with which it brings to an expression the best reason and conscience of the people, and embodies their judgment in institutions and laws. The State, therefore, lives by deliberation and discussion, and by tacit or overt expressions of the *major* opinion. The fact that laws and institutions must be constantly remolded, in

the progress of time, by the active reason and conscience of the people, is what has probably given rise to the notion, just now so popular, that ethical considerations do, or ought to, regulate legislation and social relations. The doctrine, however, that institutions must, in the course of generations, slowly change to conform to social conditions and social forces, according to the mature convictions of great masses of men, is a very different thing from the notion that rights and duties should be at the sport of all the crude notions which, from time to time, may gain the assent of even an important group of the population."

A LAST WORD ABOUT CHRISTIAN SCIENCE, MIND-CURE AND ALLIED METHODS OF TREATMENT.

By Selwyn A. Russell, M. D.

[Read before the Albany Institute, December 17, 1889.]

Mr. President, Ladies and Gentlemen — Mrs. Mary Baker Glover Eddy's book entitled "Science and Health" is the Bible of the so-called Christian Scientists. It had its genesis in the mind of Mrs. Eddy in 1866, so she claims, and made its exodus from the press in 1875. It has now reached its forty-third edition. It may seem a needless task, and a task suited to one who perhaps has little to do, to undertake at this late day any explanation of the creed of Christian Science or its methods of curing disease. It purports to be at once a philosophy, a religion, and a system of healing. Mrs. Eddy is the self-styled inspired apostle of the doctrine, the divine agent through which this last revelation was made. An insight into its inner or so-called esoteric doctrines may best be obtained, if it can be obtained at all, from Mrs. Eddy's own words. Out of her own mouth she shall be justified or condemned. The following few pages are therefore given to such verbatim quotations from her book as may best serve to render less obscure this most obscure subject. I do not feel called upon here to criticize Mrs. Eddy's style of writing, so diffuse, weak and obscure, nor to apologize for her bad English or other faults. It is hoped that the passages quoted will not be incomprehensible to the audience, and that the effort required to grasp the ideas concealed in so much obscure verbiage will not be too tedious. In reading the extracts I bespeak the indulgence of such as may be already familiar with the book, and if little interest is felt in the extracts themselves, I beg attention to the deductions made from them.

Mrs. Eddy says: "In the year 1866 I discovered metaphysical healing, and named it Christian Science. The principle thereof is divine and apodictical,* governing all; and it reveals the grand verity that

*Defined in the dictionary as, "evident beyond contradiction."

one erring mind controlling another (through whatever medium) is not Science governed by God, the unerring mind. The great facts of omnipresence and omnipotence, of Spirit possessing all power and filling all space, these thoughts contradicted forever, to my understanding, the notion that matter can be actual. These facts also revealed to me primeval existence, and the radiant realities of good; and there was present to me, as never before, the awful unreality of evil. The vision announced the equipollence* of God, consecrated my affections anew, and revealed the glorious possibilities—'Thy kingdom come on earth as it is in heaven' (Chap. I., first paragraph).

"For three years I sought day and night the solution of this problem of healing. I searched the Scriptures, and read nothing else, not even a newspaper. I kept aloof from society, and devoted my time and energies to discovering a positive rule. I knew the principle of all harmonious mind-action to be God, and that cures were produced according to primitive Christian healing, by a holy, uplifting faith; but I must know its science, and I won my way through discovery, reason and experiment. I had no human aid. The revelation of truth to the understanding came, as to all, through divine power. This is the origin of Christian Science in this century.

"My medical researches and experiments had prepared the way for metaphysics. Every material dependence had failed, and I can now understand why; for I see the means by which mortals are divinely driven to a spiritual source for help, happiness and Life. My experiments in Homœopathy had made me sceptical as to material curative methods. The drug is attenuated to such a degree that not a vestige of it remains; and from this I learn that it is not the drug that cures the disease, or changes one of the symptoms. I have attenuated common table-salt until there was not a single saline property left. The salt had 'lost it savor;' and yet with one drop of that attenuation in a goblet of water, and a teaspoonful of the water administered at intervals of three hours, I have cured a patient sinking in the last stages of typhoid fever. The highest attenuation of Homœopathy, and the most potent, steps out of matter into mind; and thus it shall be seen that mind is the healer, or metaphysics, and that there is no efficacy in the drug.

"A case of dropsy given up by the faculty, fell into my hands. It was a terrible case. Tapping had been employed, and the patient looked like a barrel as she lay in the bed. I prescribed the fourth attenuation of nitrate of silver, with occasional doses of high attenuation of sulphur. She improved perceptibly. Believing *then* in the

* Equivalence.

ordinary theories of medical practice, I began to fear a crisis, or aggravation of symptoms, from the prolonged use of these remedies, and told the patient so; but she was unwilling to give up the medicine when she was recovering. It then occurred to me to give her unmedicated pellets for a while, and watch the result. I did so, and she continued to gain as before. Finally, she said she would give up her medicine for one day, and risk the effect. After trying this she informed me that she could get along two days without globules, but on the third day she again suffered, and was relieved by taking them. She went on in this way, taking the *unmedicated* pellets, with occasional visits from me,— employing no other means,— and was cured.

"When I learned of a verity that mind, and *not* matter, effects the cure, I had such qualms of conscience over attributing the cure to matter, that I gave up a respectable profession, and heard the soft impeachment that I had lost my wits. A change of belief changes all the physical symptoms, and determines a case for better or for worse. Nerves carry a changed report according to the changed belief. If mortal mind says, 'I am deaf and blind,' it will be so without an injured nerve. Everything *opposed* to this fact (as I learned in metaphysics) makes man, who is immortal in understanding, **mortal in belief (pp. 201, 202, 203).**

"All suffering and disease are forms of thought, appearing upon the body by the consent of the mind. You may scoff at my declaration that mortal mind produces lung complaints, and all other diseases, but I repeat it: Sickness is a growth of illusion, springing from a seed of thought,— either your own or another's. If pain is as real as the absence of pain, both must be immortal (182).— One disease is no more unreal than another. All disease is the result of hallucination, and can carry its ill-effects no further than mortal mind maps out. Christian Science finds the decided type of acute disease, however severe, quite as ready to yield as the less-distinct type and chronic form of disease. It handles the most malignant contagion with perfect assurance. If you fail to succeed in any case, it is because you have not demonstrated the rule and proven the principle.

"Few will deny that death has been occasioned by fright. This proves that every function of the body, its entire organism, is governed by the human mind; unless this mind yields to the Divine Mind, and is saved from itself (188).—I have discovered disease in the human mind, and recognized the patient's fear of it, many weeks before the so-called disease made its appearance in the body. I am never mistaken in my scientific diagnosis of disease (194).— Metaphysical heal-

ing enables one heal the absent as well as the present (195).—One only of the following statements can be true: (1) That everything is matter; (2) that everything is mind. Which one is it? I demonstrated this as the leading factor in mind science,— that mind is *all*, and matter is *nought* (14).

"By mind alone I have prevented disease, healed chronic as well as acute ailments in their severest forms, elongated shortened limbs, restored decaying bones to healthy conditions, brought back the lost substance of the lungs, and caused them to resume their proper functions. Electricity is the essence of mortal mind, the counterfeit of the true essence of the Eternal Mind (p. 36). Homœopathy diminishes the drug. Its potency increases as the drug disappears. The pharmacy of Homœopathy mentalizes a drug with such high attenuation of belief, that it becomes more like mortal mind than its substratum matter, and its power to heal is proportionately *increased* (110, 111). Food neither strengthens nor weakens the body,— mind alone does this" (116).

An instance is given, ostensibly from the London *Lancet*, to the effect that a young English woman fell in love, was disappointed (presumably by the death of her lover), lost her mind, and was thereafter insane through life. She daily stood at the window, so the story goes, looking for one that was never to return. It is said that in this state of expectation she remained young, and literally grew no older. Some Americans saw her at the age of seventy-four, and supposed her a young woman; not a wrinkle or gray hair to be seen, they said she could not be older than twenty. Mrs. Eddy says of this story: "One instance like the foregoing proves it possible to be young at seventy-four, and the principle of that proof makes it plain that decrepitude is not a necessity of nature or law, but an illusion that can be avoided. *Never record ages.* Time-tables of birth and death are so many conspiracies against manhood and womanhood (132).

"Every object in the material universe will be resolved into thought whose substance is mind, not matter, and is included in the generic term *man*, of which woman is the highest species (150).—The daily ablutions of an infant are no more natural or necessary than it would be to take a fish out of water once a day, and cover it with dirt. Water is not the natural habitat of humanity. Your child can have worms, if you say so, or whatever malady is timorously holden in your mind relative to the body (159).—If we classify mortals as mineral, vegetable, or animal, an egg is the author of the *genus homo;* but there is no reason why man should begin in the egg rather than in the more primitive dust, like the *figurative* Adam (169).—Even the

Esquimaux retain health by incantations, as effectually as civilized practitioners by their *modus operandi* (171).

"If the case to be mentally treated is consumption, take up the leading points included (according to belief) in this disease. Show that it is not inherited; that inflammation, tubercles, hemorrhage, and decomposition, are beliefs, images of mortal thought, superimposed upon the body (295).—If the truth of being, while destroying error, causes chemicalization (as when an acid and alkali meet), then one must neutralize the other, for the purpose of forming a higher combination. This fermentation should be as painless to man as to a fluid, for matter has no sensation, and mortal mind only sees and feels materially. If an aggravation of symptoms sets in, you may sometimes treat the patient less for the disease, and more for the fermentation, and abate the symptoms by removing the belief that chemicalization produces pain (296).—Remember that all is mind, and there is no matter. You are only seeing and feeling a belief, whether it be cancer, deformity, consumption or fracture, that you deal with (297).—Realize that the evidence of the senses is not to be accepted in the case of sickness, any more than it is in the case of sin (322).—You cause bodily sufferings, and increase them, by admitting their reality and continuance, as directly as you enhance your joys by believing them to be real and continuous (335).—Disease is a fear expressed not so much by the lips as the functions of the body. Mitigate the fear, and you relieve the oppressed organ, and the inflammation, decomposition, or deposit will abate (337).

"God cannot mistake when He selects one for His service who has grown into such fitness for it, as renders any abuse of her mission an impossibility. A simple statement of Christian Science, if demonstrated by healing, contains the proof of all that I have said of it. If one of my statements is true, every one must be true, for I never depart from my principle and rule (470).—It is this perception of Scripture that lifted me out of disease and death, and inspires my writings (471).—It is related that a father, anxious to try an experiment, plunged his infant babe, only a few hours old, into water for several minutes, and repeated this operation daily, until the child could remain under water twenty minutes, moving and playing without harm, like a fish. Parents should remember this, and so learn how to develop their children properly on dry land" (478, 479).

In the "Glossary" of Mrs. Eddy's book, *man* is defined as follows:

"Man is the infinite idea of infinite spirit, the spiritual image and likeness of God; the full representation of mind; the idea of principle, not person; the compound idea of God, including all other ideas; the

generic term for all that reflects God's image and likeness; * * * man is incapable of sin, sickness and death, inasmuch as he derives his essence from God, and possesses not a single original or underived power. Hence man cannot depart from holiness. Nor can God, by whom man was evolved, engender a capacity or freedom to sin. * * * The highest form of man is woman" (541, 542).

Sin. This word is not defined in the glossary.

"Matter. Mythology; mortality; another name for mortal mind; a material belief, namely, that intelligence, substance, and life, belong to non-intelligence and mortality,— that life results in death, and death in life,— that sensation is in the sensationless, and that mind originated in matter; the opposite of Spirit; the opposite of Intelligence; the opposite of God; * * * that which mortal mind sees, hears, feels, tastes, smells only in belief," etc., etc. [This comprises but about one-fourth the definition given in the book.]

"Death. An illusion, for there is no death; the unreal and the untrue; the opposite of God, or Life. Matter has no life, hence it cannot die, and mind is immortal," etc., etc.

It seems scarcely necessary to say that in this alleged Science, according to Mrs. Eddy, every proposition laid down as a basis of argument is as a rule false, every question begged. No man knows that the Founder of our religion, the Man of Galilee, was never sick. It is not true that wrong thinking is the cause of all diseases; it could not be true of animals, and certainly not of plants, but plants and animals which do no thinking are subject like man to disease, old age and death. It is not true that because a fright causes disturbance of health or even death, in some cases, that it must therefore do so in all cases. It is not true that because one patient "sinking in the last stages of typhoid fever" recovered while using a high dilution of common salt, that the salt cured, or that other patients similarly affected would similarly recover. It is not true that because one case of dropsy recovered while taking ostensible medicine (unmedicated pellets), that therefore all cases will recover with the same pretended medicine. Because some forms of disease are without doubt due to disorder of mind, it is not therefore true that all diseases are due to disorder of mind. Disorders enough certainly originate in the mind, and are aggravated by attention to them, and such cases can often best be cured by mental treatment, but they do not by any means include all disorders. It is not true that nerves carry a changed report according to belief. Poison berries poison such as innocently eat them, notwithstanding the belief that they are harmless. It is not true that

to lose the reckoning of time, and to think it stands still, is to remain young — and so on, and so forth.

As to what MATTER is, scientific men are not agreed. Whether water, for example, should be called matter, whether its component gases should be called matter, or whether the possible something that lies back of these gases should be called matter, is an open question. For our purpose matter is what we see, feel, or appreciate by our senses — the so-called "first notion" of matter. Matter is forever changing its form, so that the egg of to-day will be the chick of to-morrow, and the man of to-day the dust of to-morrow. If pain is a figment of the imagination, a mere belief, is not pleasure equally so? Incapacity to suffer must mean incapacity to enjoy — in our present state. If the evidence of the senses cannot be accepted in sickness, it cannot be accepted in health; for the senses must report what they feel, and if they are liable to error in reporting pain they are equally liable to error in reporting pleasure. We are not yet disembodied spirits, and must therefore depend on our senses a while longer. Let us not try to be angels before our time.

The chief if not the only credential of Christian Science is its alleged success in curing disease. But the cause of the alleged cures, not the cures themselves, is the point at issue. As to how they are brought about will be considered further on.—The religion of Christian Science is a sort of pantheistic idealism, a groping after the solution of the problem of the one in many, an endeavor to get behind the scenes and view the invisible, to know the unknowable, or as one has facetiously said, to scrute the inscrutable.

Christian Science is an illusion, that is, a partial view, an effort to make general that which is exceptional, in short, is a rule made of exceptions. I believe it to be true that the persons who have gone over soul and body to Christian Science have done so (1) because of a mental bias to the mysterious, (2) lack of a scientific education and therefore of data by which to judge of the alleged facts, (3) lack of perspective in which to view it as a whole, and (4) a recoil from an excessive materialism. They are not aware that other and very different agents have been in all ages just as powerful curative means as Christian Science. They have been brought into too close contact with it to see it in all its aspects, and need to isolate themselves from it in order to distinguish its truth from its errors. The lover sees no fault or defect in his beloved, but his neighbors not so near or interested see that she is not very unlike many of her companions.

Christian Science is therefore more significant as a criticism of those embracing it, and as a sign of reaction against the materialistic habit

of the times, than as a method of cure. Let a man stand here to tell you of Shakespeare. You know Shakespeare already, and perhaps better than he, and therefore obtain no new information of Shakespeare; but you get information of the man, for he has unconsciously revealed to you his own bias and character in the endeavor to impart information of another. Man's opinion of the world is a confession of character. The age tends to materialism, and we are taught to give the greatest respect to material things; but intelligent men have nevertheless found that it is the imponderables that move the world, which is seen as well in medicine as elsewhere. When the best medical treatment has failed to effect a cure, how often it occurs that some change in the patient's mind — as by some fortunate or wished-for event, change of scene, removal from circumstances which annoy, embarrass or irritate, in short, a change from discontent and despair to contentment and hope — has speedily wrought the desired cure.

The confidence placed in medicine by the most intelligent physicians is almost always secondary. Medicines do sometimes cure, often materially aid nature in effecting a cure, but are also capable, even in legally qualified hands, of doing indescribable mischief; they must therefore take a subordinate place as curative agents, and are often altogether disappointing. Medicine is a two-edged sword that cuts both ways; an evil, to be used only in order to overcome a greater evil; an agent capable of doing when improperly used as much harm as good. Some may object to these as unsettling statements, and ask, why destroy confidence in the support on which we have so long depended, the staff on which in sickness we have so often leaned ?

The popular mind has been so long deluded with an excessive belief in medicine, resulting in undue reliance on it and medical men, that we have well-nigh forgotten our personal resources and the healing powers of nature. What wonder then that some, as now, having seen in the treatment of disease repeated proofs of the power of the mind and the uselessness of medicine,— what wonder that such, comprehending for the first time this significant truth, have been swept off their feet and carried to the opposite extreme — into a belief that mind is all ? Once partial to medicine and ignorant of the mind and its influence, they have gone to the opposite extreme, and are now partial to mind and ignorant of medicine and its influence. Wrong first and last, for the whole truth includes both of these half-truths. There is mind and there is matter, and these instead of being antagonistic are complementary to each other, and, like the two sexes, are **fertile only when brought together.**

These different systems of mind-healing are but so many indications

of the reaction which is going on against an excessive materialism. But the reaction has already exceeded a safe limit in such as have joined themselves to any of these one-sided systems, for the whole truth cannot be stated in a single sentence nor found in a single theory.

If our education and alleged culture have been acquired at the expense of bodily health and a vigorous and assuring self-reliance, have they not cost too much? Do not our methods of rearing children and our own habits of life inevitably produce weakness and susceptibility to disease? Finding ourselves weak and easy victims of disease, what more natural than that we should look about for something to remedy the weakness and cure the disease? Hence man flies to medicine and all manner of external and artificial supports. What is the alternative? With the body strong and the mind pre-occupied man is not likely to be preyed on by disease, for the system so fortified is hard to get into and harder to overcome. Very easily does the weak and delicate product of our civilization—the average man—fall a prey to the slightest symptoms, surrender at once, take to the bed, and send for the doctor. The less highly civilized man, relying more on himself and nature, stands on his feet and dares the devil. Hew the savage with a broad-ax, and in a day or two the flesh unites, as water from the parting keel; the same blow consigns the white man to the care of the undertaker.

If the claims of Christian Science rest principally on its alleged ability to cure disease, and they do so rest, it may not be amiss to look back into the past, and around us in the present, for cures as numerous, as wonderful, and as miraculous, as any performed by Mrs. Eddy and her disciples.

Dr. Elisha Perkins was born in Ct., in 1740, and practiced with success for many years. At length, inspired by the recent discoveries of Galvani, he conceived the idea that metallic substances applied in a certain manner might remove disease. In 1796 he gave to the world his metallic "Tractors." These consisted of two pieces of metal, one iron and one brass, about three inches long. He affirmed that they cured rheumatism, local pains, inflammation, tumors, etc., by being drawn over the affected parts. He patented his discovery and soon found numerous adherents, many of them being among persons of wealth and position. His son crossed the Atlantic with the Tractors, their reputation was soon established in London, and they became the fashion. The Royal Society accepted both the Tractors and Dr. Perkins' book, and passed a vote of thanks to him. Within five or six years a "Perkinean Institution" had been formed, which published transactions, and held annual dinners. Lord Rivers was the first

president, Governor Franklin vice-president, and Lord Hanneker, a fellow of the Royal Society, one of its members. All this time the son was coining money by selling Tractors for twenty-five dollars, which cost less than twenty-five cents. A hospital was built where the only treatment was "Tractoration." Persons in the highest positions willingly gave testimonials telling of marvelous cures wrought on themselves and their friends by the wonderful Tractors. The bishops and clergymen on both sides of the Atlantic were eager to thrust forward evidence on this medical topic. The lame were made to walk, stiff and useless limbs were rendered flexible, chronic rheumatism and paralysis cured, sleep produced, pain allayed, etc., etc. The bubble of fraud was at last burst by a physician who experimented on patients with tractors made of wood, with which he was quite as successful as with the metallic ones. The Perkinistic enthusiam however did not die out at once, but passed so gradually and quietly away that the date of its death is not recorded. Froude says: "Belief in the marvelous does not rise from evidence, and will not yield to it."

Another instance of a similar illusion was that of John St. John Long, who early in this century achieved such success in London as a healer of diseases, that his income for several years exceeded $60,000. He pretended to have a wonderful liniment which when applied to a healthy part was as harmless as water, but when applied to a surface covering a diseased part caused the morbific humor to exude. His success was great. Patients from London and all parts of the country rushed to consult the miracle-worker. Ladies of the highest rank hastened to place themselves and their daughters under his care. He was shrewd enough not to undertake to cure cases which were apparently hopeless. He went into fashionable society, and was a lion in the most aristocratic circles. He wrote a book called "Discoveries in the Science and Art of Healing," which was well padded with testimonials of miraculous cures from his aristocratic friends. But misfortune overtook him, resulting from the bad effects of his liniments in a few cases. These trials scarcely lessened his popularity, and he went about proclaiming himself a martyr, comparing his case with Galileo, Harvey and others. He died young, and his admirers raised a magnificent monument to his memory, adorned with a long and laudatory inscription. The wonderful liniment turned out to be *acetic acid*, which looks much like water. He of course substituted water when he did not want the "morbific humor" to come out, and so gulled his willing victims.

Perhaps the most remarkable example of credulity and superstition is found in the history of two quackeries which flourished in the six-

teenth and seventeenth centuries. I refer to the "weapon-ointment" and the "sympathetic powder" cures. The "weapon ointment" was used in healing wounds, but instead of being applied to the wound itself, was applied to the weapon which caused it. The ingredients were various — human fat and blood, moss from dead men's skulls, bull's blood and fat, etc. The wound was washed and bound up, and the weapon was then smeared with the ointment, bound up and laid away. The ointment would "cure at a distance." The "sympathetic powder" was a similar sort of remedy. A solution of the powder was made, into which the wounded man's blood-stained garments were immersed, the wound itself being then washed, bandaged, laid at rest, and abstinence enjoined on the patient. The powder, like the ointment, cured at a distance.

St. Patrick, the Patron Saint of Ireland, healed the sick, the lame, the blind, and in thirty-three instances, it is said, raised the dead. Other saints in the Church of Rome have similar records. (See Dublin Review, October, 1880.)

"King's Evil," a scrofulous disease, was for many centuries professedly cured by the touch of the Kings of England and France. The practice began in the time of King Edward the Confessor (1043–66). Charles II. of England (1660–84) carried the practice to the greatest extreme of any English monarch, having "touched" nearly 100,000 patients during his twenty-five years' reign. It was last employed in England by Queen Anne (1703–15), Dr. Samuel Johnson having been when a boy one of her patients. Louis XVI. of France performed the ceremony as late as 1775. The efficacy of the remedy was such that Dr. Carr mentions as having been healed the full number touched by Charles II. It will probably be admitted by all that Charles II., one of England's most profligate kings, was not a very likely person to have been made the chosen vessel for any supposed spiritual powers.

At Lourdes, France, an apparition of the Virgin Mary was seen at a certain grotto, in the year 1858, and since then Lourdes has been a sacred place to a large portion of the Christian church. Thousands have gone thither to bathe in its waters and receive miraculous healing. The recorded cases of well-authenticated cures are almost numberless.

At Knock, in the west of Ireland, in the summer of 1879, there was seen another apparition of the Virgin, and this place subsequently became the resort of great numbers of pilgrims in quest of health, and the scene of numerous cures, caused by using the whitewash or cement from the walls of the chapel where the vision was seen.

Hundreds of certified cures have also been wrought far distant from these places by simply using the water or the cement and invoking the pity of the Virgin.

In Canada, near Quebec, is a hamlet called Sainte Anne de Beaupré, in whose soil are said to be deposited certain relics of Sainte Anne, the mother of Mary. To this place resort hundreds of the sick and the maimed and the blind, who are miraculously healed, for is there not in the church there a mountain of crutches to witness to the fact? The pyramid of crutches is twenty-two feet high, divided into six tiers, and crowned with a statue of Ste. Anne. This place has been the scene of miraculous cures for more than two hundred years. In many cases sworn testimony is given to cures of persons who had been pronounced incurable by physicians.

Another similar method of treatment is the so-called Faith-cure, with its Beth-shan in London under Rev. W. E. Boardman; its numerous "homes" in and about Boston under Dr. Cullis; while in New York its chief exponent is a Rev. Mr. Simpson. Many sick persons recover at these different places, many are not benefited, and some die, but of the two latter no testimonials are published. Remarkable cures of paralysis, consumption, lameness, etc., are claimed, and letters published describing them. One of Albany's eminent teachers, while summering at Intervale, N. H., where is located the summer residence of Dr. Cullis and one of his "homes," wrote a most interesting account thereof to the *Albany Journal* last August ('89). She describes Dr. Cullis as an energetic man of practical business sagacity, whose faith has worked well to secure money and other worldly comforts. He owns at Intervale a tract of many acres, from which he has sold lots conditionally, and derived large profits. The letter goes on to say: "Appropriate texts of Scripture placarded on the trees meet the eye here and there, and might touch the heart if the cry for MONEY did not drown their still small voice. Call this the result of faith in any but the sense in which good men use it ordinarily in connection with the affairs of this world, and reason revolts." Pressing appeals for money appear to be the chief feature of his religious services, as also of the publications he sends out. It is stated by good authority that Dr. Cullis resorts to dishonorable business methods, according to the estimate of business men. I regard Dr. Cullis as a committed man, pledged to a theory, a man who has spoken and thus bound himself to a system, and therefore no longer free to speak his honest convictions — watched as he is by the sympathy or hatred of hundreds whose affections he must now take into account. He may have begun with the conviction that faith

was enough, but now, having got so far, it is impossible to go back without stultifying himself; he is therefore driven by the hobgoblin of a foolish consistency to go on, in order to maintain his standing. If he resorts to questionable means, he probably prefers such a course to an ignominious recantation. Having set out to show that faith is all, he has found, unfortunately for his theory, that faith is only a part.

Hahnemann, the founder of Homœopathy, had some queer notions which in the few decades since his death have not found universal acceptance. He believed and taught that a medicine which produces head-ache, for example, is the best cure for head-ache; or, in the usual Latin phraseology, *similia similibus curantur* (like is cured by like). 2. That it is necessary to give infinitesimal doses. "If the patient is very sensitive," he says, "it will be sufficient to smell once of a vial containing a globule of sugar the size of a mustard seed; after the patient has smelled it, the vial is to be recorked, and the medicine will thus serve for years without its medical virtues becoming perceptibly impaired." 3. That seven-eighths of all chronic diseases are produced by the itch. "This itch," says Hahnemann, "is the sole, true and fundamental cause that produces all the other countless forms of disease," and he adds that it took him twelve years to trace out the source of all these diseases.—That the itch is the cause of such an array of ills is no longer maintained by his followers; the use of infinitesimal doses is also discarded by the leaders of the school; and, lastly, even the doctrine of *similia* is doubted by many eminent Homœopathists. (See Dr. Geo. Wild, vice-president of the Br. H. Soc., in *Lancet*, June, 1887.)

It is probably true, however, that, speaking generally, as many cases recover, or, to use the common expression, as many are cured, by the Homœopathic as by Allopathic treatment, and the greatest triumphs of Homœopathy have been achieved by the employment of Hahnemann's infinitesimal doses. Other beside Mrs. Eddy have recognized the long stride between the heroic treatment of the past and the mild treatment of the present; and also the more recent stride, perhaps quite as great, that between the use of ostensible or pretended medicine and of naked faith.

It is without doubt better in diseases which of themselves tend to recovery, as the great majority of diseases do, to give little or no medicine, and in such cases the Homœopath is likely to be a safer man than the physician who relies too much on drugs, or gives them without the necessary caution. Most people, however, rely on medicine and will have it, and therefore the physician is too

often obliged to accede to this wrong notion. When the layman's education and insight are sufficient to enable him to appreciate the small utility of drugs, and the great utility of self-reliance, hygienic conditions, good nursing, and the natural forces, he will give up the habitual employment of what is at best but a doubtful expedient.

It is not pretended that medicines are useless; they are most useful, but, like edge-tools, must be handled with care. I know no *a priori* reason why drugs should be expected to cure disease at all, except by chemical, mechanical, germicidal, or other similar action, although Prof. Huxley is said to hold the belief that somewhere in nature there exists a remedy for every disease. This truly puts a premium on the infraction of nature's laws, and gives no encouragement to preventive medicine; for if this were true, what would prevent man from breaking all the laws of health and exposing himself in all ways? What harm can result from ignorance or carelessness, if a kind Providence has furnished a remedy for every consequent evil? The opposite ground, namely, that medicines are poisons, is much the safer and better alternative. In most instances it is because of the infraction of the laws of health that medicines are required at all.

The salutary effect of true Homœopathic treatment is through the mind, is really mind-cure under another name, and has been called the art of amusing the patient while nature cures the disease; the salutary effect of Allopathic* treatment is through both body and mind. Physicians of all schools do great good by inspiring hope and confidence, by quieting the mind, and by attention to nursing, hygienic surroundings, etc. The Homœopath does good in a negative way, by doing no harm; the Allopath by the careful and intelligent use of medicines for all they are worth. The Homœopath does harm by employing insufficient medicine in cases where medicine is really necessary, the Allopath by employing it in excess or unnecessarily. It is probably but a small minority of Allopaths who appreciate the potency of drugs for evil as well as good, and use them with the necessary caution. Most experienced physicians put little faith in drugs, and put that faith into practice with little assurance when they are sick themselves. It is a proverb that physicians never take their own medicine. Unfortunately most men, sick or well, feel obliged to lean on something foreign to themselves, some external support; that something in the old school is *real*,

---

* The words *homœopathy* and *allopathy* were both coined by Hahnemann. He used the word homœopathy to distinguish his own theory from the supposed theory of the *old school*, which he said was allopathic, implying that a medicine which produces symptoms *unlike* a disease is the best cure for that disease,—the reverse of homœopathy. The name is of course erroneous, and the old school has never in any way accepted such an exclusive theory, but professes to elect that which is good from all sources, even from homœopathy.

in Homœopathy *ostensible*, in the different forms of mind-cure, including Chrisian Science, *blank faith*.

Countless are the cases of physical disorder and disease both caused and cured by mental influence. Thus, some years ago, a medical student in Paris, on being initiated into the mysterious rites of a masonic society, was subjected to a sham operation of blood-letting. His eyes were bandaged, a ligature bound round his arm, and the usual preparations made to bleed him. When a pretense of opening a vein was made, a stream of water was spurted into a bowl, the sound of which resembled that of a flow of blood which the student was anticipating. The consequence was that in a few minutes he became pale, and before long fainted away.

A case is recorded of a man who was sentenced to be bled to death. He was blindfolded, the sham operation was performed, and warm water allowed to run down his arm in order to convey the impression of blood. Thinking he was about to die, he did actually die.

A condemned man lay with his head on the block waiting the drop of the executioner's ax. A reprieve suddenly came, but it was too late, as the anticipation of death had arrested the action of the heart, and when the bandage was removed from his eyes that he might read his reprieve he was dead.

The case of Louise Lateau, the *stigmatisée*, of Belgium, illustrates the power of concentrated attention—in this instance the intense contemplation of Christ's passion by a very religious and emotional girl—in producing marks on the skin and perhaps the exudation of blood.

Familiar to all is the retarded or interrupted digestion in persons of mobile nerve temperament, caused by emotions of almost any sort. The appetite is often made to disappear, or an actual loathing of food brought on. One hundred patients in a hospital were made the subjects of an experiment, and given some inert liquid. A little later, full of alarm, the house physician rushed into the wards and pretended that he had by mistake given them an emetic. At once no fewer than eighty of the hundred were unmistakably taken sick.

Dr. Tuke says he has seen the hair change color from brown to gray, and gray to brown, corresponding to alternations of sanity and insanity.

Powerful emotions not only interfere with but often entirely prevent the perception of impressions made on the senses. The battle-field affords many examples of the influence of engrossing emotion in blunting sensation, and many a soldier has got his first information of severe and fatal wounds only by *seeing* his own blood.

An account is given of an English lady who had been an invalid for years, and had tried nearly all sorts of medicine and doctors without benefit. She wished as a last resort to try Homœopathy. A Homœopathist was therefore sent for, came, and prescribed; but as he had not the medicine with him which he wished to give, he said he would send it by mail. A short time after his departure there came a package of what the woman supposed to be the medicine she expected. She took it and recovered. It was afterward learned that instead of the medicine she had taken some sort of percussion caps, which were intended for the husband's hunting expedition. But her faith had saved her.

Dr. Abercrombie relates the following: A woman who had been many years a paralytic recovered the use of her limbs, being much terrified during a thunder storm, as she was making violent efforts to escape from a chamber in which she had been left alone.—A man affected in like manner recovered as suddenly when his house was on fire. Another who had been ill six years recovered during a fit of anger. A friend living in the city related to me recently the case of a woman who regained the use of her legs in the alarm and excitement of a railroad accident; she was previously unable to walk, and her legs were quite useless.

Sir Humphrey Davy relates this cure of a paralytic: He placed a thermometer under the tongue simply to ascertain the temperature, but as the patient at once experienced some relief, the treatment was continued for a fortnight, when it ceased to be required, for the patient was well.

Tissot records the following: A man of letters reached an advanced stage of consumption, when he consulted a physician. At this period he happened to obtain fresh literary distinction, and was fortunate in other ways; the consequence being that he was greatly delighted. The physical effect was that his pulmonary affection was suspended, and remained stationary a long time.

Dr. Rush refers to a case of a young woman who had taken the usual remedies for abdominal dropsy without any benefit. Dr. Hull was consulted, and immediately proposed that the operation of tapping be performed. To this she objected, but so great was her fear of the operation, which the proposal of it had excited, that it brought on an excretion of the water, and in a few days she was perfectly recovered. Other very similar cases might be cited, one of which occurred in Albany.

That almost all diseases have been cured by mental influence is a well-known and fully recognized fact, and the question as to *how* the

cures have been wrought is of the greatest interest. It is reasonable to believe that if certain mental states can *unfavorably* change the functions of organs, and cause temporary disorder (as is often the case with the stomach and heart), other mental states are conceivable which can *favorably* change them. For example, any thing which depresses the mind may seriously interfere with digestion; change now the mind to a more cheerful and happy state, and the stomach resumes its proper work and the indigestion is cured. Conceive of the depressed state as chronic or abiding, and there is adequate cause of chronic dyspepsia. This rule holds good with other organs.

The effect of the emotions on the skin and mucous membranes, causing heat or cold, dryness or moisture, is probably experienced by most persons.—It is not unusual in the experience of physicians to treat cases of relaxation of the bowels, for example, brought on by any thing that annoys or depresses the mind. It has been maintained by eminent medical authority that disease as serious as cancer may owe its origin to concentrated attention to the part affected. Dr. Murchison said: "There is good evidence that nervous agencies may not only cause functional derangement of the liver, but may cure real or structural disease of that organ."

But I seem to have wandered from my subject, and it may be asked, what has all this to do with Christian Science? Christian Science, in essence, is nothing new, but hoary with age now appears with a new name and new garb, that is all. It is to be considered as on a par with Perkins' "tractors," the water of Lourdes, the cement of Knock, Long's liniment, the "weapon ointment" and "sympathetic powder," the king's "touch," faith, and all the numberless mysterious forms of healing which have been known since the foundation of the world. These all have had and still have believers thoroughly convinced of their reality and power, and all have had cures as numerous and miraculous as those presented by Christian Science. They all have had about the same successes and the same failures. None of them has satisfactorily authenticated cures of fractured bones, for example, or the specific fevers — measles, scarlet fever, small-pox, and so on — though all of these may have been recovered from under any or no form of treatment. Intelligent laymen as well as physicians know that most diseases have an inherent tendency to recover of themselves, perhaps nine-tenths or nineteen-twentieths needing no medical assistance whatever, and in such cases the physician who does least harm does most good. No honest physician pretends to *cure* them, although he may assist nature in her effort to cure.

Dr. Eggleston, of Chicago, in a recent number of the *North American Review*, says we have too many physicians, and that one physician could easily attend to all the cases of sickness now distributed among three. Most physicians are dependent on their practice for a livelihood, which fact might force them of necessity, under existing circumstances, to magnify their calling, exaggerate the gravity of disease, extol the virtues of medicine, and decry the power of nature. Medicine has been prostituted to the level of a trade, and the business methods employed in it have become a reproach. In the United States the relative number of physicians to the whole population is one to six hundred, in Germany one to three thousand, in Russia one to six thousand, and it is not known that either Germany or Russia suffers thereby. In Germany there is general complaint of a surplus of physicians.

Is not our education largely at fault, in teaching a reliance on drugs or other foreign support rather than on ourselves and nature? The oldest and wisest physicians, it is said, give the least medicine, and do most remarkable cures with bread-pills. Many of our diseases are comparable to our prejudices; they come without reason, continue without reason, and neither reason alone nor medicine will dislodge them, but Christian Science may, the water of Lourdes, the faith-cure, or any sufficiently strong mental influence. Our diseases, moreover, are sometimes our only occupation, and we are therefore not disposed to give them up. Many confirmed invalids, under constant medical treatment, are such only because their mental constitution, and its effect on the body, is not understood by the friends or physician, and what might easily be cured by proper means is thus suffered to go on for years under a total misapprehension. It is these cases principally which furnish to Christian Science and mind-healers their most astonishing cures. Hysteria may simulate almost every form of disease — spine and joint affections, paralysis, blindness, deafness, fits, loss of feeling, shortening of limbs, dyspepsia, etc. — any one of which may therefore be cured instantaneously by any strong mental impression, as shock, fright, expectation, the command to "rise and walk," or the delirium of Christian Science.

I need not speak here of the too frequent mistaken judgment of medical men of all schools as to the exact disease present in any given case. Many mistakes are made, and sometimes not till after death is the real cause known. There is no doubt also that *many* fall victims to injudicious medication — unnecessary or excessive medicine — prescribed by legally qualified men.

Mental pain—as anxiety, disappointment, annoyance, dissatisfaction

—has the same effect on the body as physical pain, and may therefore impair the appetite, digestion, nutrition, cause loss of sleep, emaciation and exhaustion. It is plain that if there be any weak point in the system it may now give way, be it the heart, lungs, stomach, bowels, liver, brain, or other part. What are the indications in such a case? To treat the particular organ affected — the weak part which has first failed — or the underlying low physical state and its antecedent low mental state? Of course the latter. Any thing which now properly diverts the mind from the bodily disorder, and particularly from its mental cause, will cure. Too often a symptom or set of symptoms coming on frighten and subdue the patient at once, instead of exciting in him a manly resistance. It is a well-known fact that many symptoms and sometimes severe disorders may be bluffed off, snubbed, as it were, till they take their departure. A little of the Spartan training would do most of us good. Let us learn to live simply and lie hard, fortify ourselves, and render the system invulnerable by the careful observance of the laws of health, rather than foster the spirit of dependence which renders us so helpless and vulnerable. Resources we must have within us. Let the will be in command and the nervous system under control. When the mind is preoccupied with useful thoughts and the body with useful actions there is little room or leisure left for harmful introspection and attention to different organs, which do their work best when least observed. Many of the organs, such as the heart, for example, are embarrassed by the attention too often given them, and exhibit disordered functions just so long as they are the object of attention, and no longer.

I do not know that I have cleared up as yet any mystery which may envelop Christian Science, but if the lines do not, perhaps reading between them may, express my meaning. Christian Science is a sort of epidemic delusion.— A moment's reflection will show that our prevailing ideas respecting almost any subject, correspond at best to a very loose process of reasoning. The accidents of personal experience, our opportunities of observation, the traditions which colored our first ideas, the influence of dominant feelings — these sources of error or self-deception must have had as much to do with our present solidified knowledge as any thing that can be called the exercise of individual judgment and reasoning power. Mistaken judgment, or illusion, is often due to faulty mental habits, such as the want of attention, discrimination and comparison; it is due also to defective grouping of elements, a grouping which answers to the individual experience but not to general experience; also to a partial or one-sided seeing, to which the mind by its peculiar predisposi-

tion inclines. A fettered or prejudiced attention is altogether liable to produce a wrong interpretation of a thing when it is seen, that is, a vivid preconception of a thing too often determines the perception of it. The thing seen by the mind's eye is imposed on the thing really seen, and so imagination takes the place of sense and blinds the eye to what is actually before it.

The unchristian and unscientific qualities of Christian Science are so apparent as to need no word from me. With it money is the principal thing, healing being an altogether secondary consideration, which facts alone discredit its claims. It is remarkable that persons unable to explain some of the elementary vital processes, still profess to have a theory of life, and, unable to explain the cardinal facts and laws of light, heat, etc., are confident in their assertions respecting the universe, its origin and purpose. No wonder then that instead of laboriously ascertaining what is known of matter and its properties, they imagine that by an easy divination they can detect the nature of matter. Instead of classifying the observed phenomena they classify their conceptions without verifying them. Start with a theory not based on facts, to explain certain phenomena which have not been established as facts, the conclusions can have no value whatever.

This crusade against the human senses and reason becomes most injurious when it is taken as a heavenly guarantee for the truth of particular opinions or particular events. Of all moral engines, faith which is inspired by a religious creed is perhaps the most powerful. All that the mind-healers really accomplish can be paralleled without assuming any supernatural cause. According to Dr. Buckley, the lowest formula is concentrated attention; if to this be added reverence, whether for God, spirits, or simple mystery, the effect is greatly increased; if to this there again be added confident expectancy of particular result, the effect in causing sickness or relieving it, or in causing actual death is appalling.

Of course it is most absurd for a pretended teacher of Christianity to put such interpretations on the Scriptures as will place them in daily and hourly contradiction with facts, for the truth of which we have all the evidence that our nature is capable of receiving. The culture of science is incompatible with the special support of any dogma, for if the dogma were true, making it an object of special care or reverence takes it out of democratic relations with other truths, and so injures it and us by influencing us to unduly neglect or favor other truths. The dogmatist has nowhere such a favorite field as the spiritual or theological, where he may convert his own imaginings into objective verities, and draw endless conclusions without fear of

contradiction. Here he does not strike his head at once against the well-known safe-guards of knowledge, because his head is in the clouds. By hypothesis he has transcended all the canons of reason.

Let us look into the eye of Christian Science, search its nature, inspect its origin, and see the birth or whelping of this supposed lion, which lies no great way back; we will thus find in ourselves a perfect comprehension of its nature and extent. The world is his who can see through its pretension. Let us not yet accept it as a fixed rule that God only is substance and his methods illusion. Knowledge is the knowing that we cannot know. The lesson of life is practically to generalize, to believe what the years and the centuries say against the hours; to resist the usurpation of particulars, and penetrate to their general sense. Things seem to say one thing, and say the reverse.

MOUNTAIN METEOROLOGICAL STATIONS AND AN INSPECTION OF PIKE'S PEAK IN ITS WINTER SEASON.

By Lieut. John P. Finley, U. S. A.

[Read before the Albany Institute, March 4, 1890.]

There is some division of opinion among meteorologists as to the value of mountain stations of observation. The United States Signal Service has maintained for over ten consecutive years the two most notable stations of this order in the world. I refer to Pike's Peak, Col., and Mount Washington, N. H. On the former the station has an altitude of 14,134 feet above sea level, and on the latter an elevation of 6,279 feet. The highest stations in other parts of the world are, Leh, 11,503 feet, Southern Asia, province of Ladakh, Lat. 34° N. Long. 78° E.; and the Sonnblick in Austria, 10,154 feet. In France the highest station is the Pic Du Midi, 9,380 feet; in Italy, the Val Dobbia, 8,360 feet; in Mexico, Zacatecas, 8,189 feet; and in Switzerland the Col de St. Theodule, 10,899 feet.

The official report of the Chief Signal Officer for 1885 records my inspection of Pike's Peak, as April 10th to 17th, inclusive, in that year. This period of time (eight days) will appear significant when it is understood that, on the average, only two days are required for the inspection of a Signal Service station, and that since the establishment of the Pike's Peak station, July 21, 1873 (over twelve years), during which period the base station had been inspected ten times, my visit made the longest inspection on record, the average being about three days. These inspections were made in the months of January, April, June, August, September, November and December, but the Peak was only ascended in the months of January, December, September and August, when it is most convenient of access. As the meteorological work comprised the maintenance of two stations, one at the summit and the other at the base (Colorado Springs), connected by seventeen miles of telegraph line, it was considered advisable, at times, to confine the inspection to the base station.

My inspection was made unusually long for two reasons: first, because of the difficulties encountered in reaching the summit, and, second, because of the very large amount of property which required examination for purposes of condemnation and destruction. If I remember rightly, property had been accumulating for over seven years, and it was scattered along the seventeen miles of road and trail, from base to summit, in addition to large quantities at each station. The property was of a motley description and comprised every article known to the Signal Service, both animate and inanimate, from a pair of tweezers to a mule and cart. The mules were of the regulation army pattern. Some of the articles were buried under sixty feet of snow; others were resting quietly, but in a demoralized condition, among the tree-tops along the trail, left there as the snow melted away during the summer months; and others were found safely packed away in a side-tracked freight car, near Manitou Springs, which car, I found, had traveled all over the State of Colorado and parts of Kansas and Wyoming, trying to find an owner for its burden of telegraph material.

The title of my paper appears to signify that my inspection was not made in what we are accustomed to consider the winter season. That is true. Not the winter of the lowlands, but the winter of the great peaks of the Rocky ranges. The inspection began, as before stated, in the second week of April, and continued throughout that week and the one following. April is the greatest snow month of the year on Pike's Peak. Besides having the greatest monthly precipitation of snow, it finds upon the ground the accumulation of the six previous months, which, on the average, amounts to about 100 inches. The snowfall in April is on the average nearly twice as great as that of any other month. In 1879 the fall reached the unprecedented amount of 131.5 inches of unmelted snow, the most excessive precipitation recorded at the station during the entire period of its maintenance, over fifteen years. Snow is precipitated in every month of the year; rain only in June, July, August and September; sleet in April to October, inclusive; and hail in March to September, inclusive. Rain fell once on March 3, 1874, sleet on November 20, 1885, and on March 25, 1874. In August, 1874, the entire precipitation was snow, amounting to thirty-seven inches, unmelted. In May, 1879 and 1880, and in June, 1879, 1880 and 1881, all was snow, sleet or hail, the average being sixteen inches and the maximum thirty-three. The smallest precipitation occurs in the months of September to March, inclusive, the lowest monthly amounts ever recorded being .07 inch in November, 1883,

and .10 inch in January, 1884. The months of greatest excessive precipitation are April, May and August, with April at the head. It must be noted that on some parts of the Peak the snow does not disappear throughout the year, and thus it is possible to see the accumulations of several years in enormous masses, which, from various causes, give rise to destructive "snowslides."

The lowest temperatures occur in the months from November to March, inclusive, yet April has reported them over 20° below zero. It is interesting to note, in this connection, that the next greatest minimum recorded on the Peak is 37° below zero, and that it occurred in January, 1883, February, 1875, November, 1880, and December, 1878. The lowest, 39° below zero, occurred December 21, 1887, and the highest, 64° above zero, on July 19, 1879. The lowest mean monthly temperature, 1.9° below zero, occurred in January, 1883, and it has fallen to 8.5° below zero in April. It thus appears that April has all of the characteristics necessary to make it a part of the winter period of the Peak, and is especially noted for its great snowfall and accumulated snow, making the ascent of this towering monarch of the Rockies one of great difficulty and danger, in that month of the year.

On arriving at Colorado Springs I sought comfortable quarters at the famous hostelry, "The Antlers," where from one of the verandas I could observe the great Peak, the extreme upper portion of which was lost to view in the clouds. The grandeur of the scene was most impressive, yet it was but a mere suggestion of what was in store for me. The hotel is situated about five miles from the base of the mountains, but from their gigantic size, towering height, and the clearness of the air they appear much nearer, and seem to be hovering over the city, which gives an added impression of immensity.

At the Signal Office, I found Sergt. Hall, a faithful, competent man, whose five years' service in charge of the base and summit stations far exceeded that of all other observers, in point of time, and made him the most experienced and reliable of the fourteen different men who, at various times, held the position of Observer in Charge. I was very fortunate in finding such a man to act as my assistant in conducting the inspection of the stations, and to him I owe, with gratitude, the preservation of my life and a safe deliverance from the perils that surrounded us in our long struggle to reach the summit of the Peak. When I made known to the Sergeant that I not only proposed to inspect the base station, but the summit also, he was amazed, and respectfully suggested that the trip would be a very dangerous one,

and that possibly I had little or no conception of the difficulties to be encountered at this time of the year. Moreover, he invited my attention to the fact that the two men constantly on duty at the Peak had been cut off from the rest of the world, for about two months, it being utterly impossible to reach them, owing to fierce winds and the great amount of snow. This condition of things created some excitement throughout the country, and it was generally reported in the papers that the men at the summit station would undoubtedly perish from cold and hunger, when, as a matter of fact, they had plenty of provisions and fuel, and were much surprised at hearing of the unusual anxiety of the general public.

Sergt. Hall had sufficient data to convince one that the trip was not likely to be a delightful little tour for observation and recreation. I silently admitted these facts, but quietly persisted in making preparations for the ascent. When my mission became known at the hotel, some "old timers" volunteered the information that I must be a "tenderfoot," and that it would be well to inject into my brain something that would tend to counteract my apparently serene self-possession and overweening confidence. Little did they know that I was really convinced of the magnitude of the task, but felt that the proper performance of duty was paramount to all other considerations. In order to save time I compromised withthe Sergeant and the "veterans," and promised that if I could not succeed in passing "Windy Point" (a very dangerous locality for "snow-slides") I would return. This was not a very definite agreement, but it was all that I would make, for I had quietly determined upon the course necessary for me to pursue. Further opposition in the form of kind advice and earnest solicitation for my safety, coupled with some concern as to a full possession of my senses, having been overcome, I proceeded to make immediate and rapid preparation for the proposed trip.

The first step was to secure means of conveyance as far as such assistance could be employed. It was conceded that the most difficult work must be performed on foot. Under such circumstances all articles required to be gauged by the transporting capacity of the least power available, which, after some calculation, we found to be a badly demoralized and generally worn out human being. In other words, what could each of us (the Sergeant and myself) carry when under the influence of the greatest exhaustion, from struggling through the snow and over rugged rocks? The following articles were finally decided upon as indispensable for each man. An Alpine pike, a hatchet, a pair of snowshoes, a revolver, a bowie knife and one day's provisions.

Rather a novel assortment for meteorological work, but really a very necessary preparation for the duty required. I insisted on carrying a mercurial barometer strapped to my back, although the Sergeant said it was anextra burdenwhich I ought not to think of taking. No other inspecting officer had taken one and, besides being very burdensome, it would probably be destroyed before the completion of the trip. But the barometer went, performed its duty, and returned victorious. Now for the conveyance. No one in town would rent a horse for the trip, as they said it was madness to attempt the ascent in such weather, and at the time of year. But we could fall back on the government mules, and this we did, quite reluctantly, however, with a full appreciation of the peculiar uncertainties which mule flesh is heir to. The mules were large, strong, and perfectly white, strange to say, and the one which I selected eyed me very significantly, as if objecting to my size and weight, over six feet and about 240 pounds.

The saddles were put on and properly "sinched." Before finally mounting for the journey we gave our feet and legs a peculiar suit of clothing, consisting of heavy arctic overshoes and a thick swaddling of gunny-sacks. The latter were cut in long pieces and wrapped around the feet and legs in continuous bands, until these parts of the body were about twice the natural size. Each wrapping was held in place by the use of twine. After we had completed our toilet in this respect and swelled out over other parts of the body, in a similar manner, for protection, we presented a grotesque appearance. Away we started on the mules, and it was soon apparent that my noble steed preferred to "go it alone" without consulting my wishes. I appealed to the Sergeant for an unbiased decision in the case, and with some merriment in his voice, and a twinkle in his "weather eye" he "'lowed" that the mule should "boss the outfit." Being on the mule's back and directly over his fulcrum, in case of a double-back-action of the posterior extremities, I accepted the situation without a murmur.

We entered Manitou Springs without further interruption and there watered our beasts of burden, and for our own refreshment quaffed some of the sparkling iron and sulphur waters. This picturesque retreat for invalids is one of the most delightful places of the sort I have ever visited, and I shall never forget the magnificent, awe-inspiring scenery that surrounds it on every hand. It is truly a mountain town, but saved from the usual roughness of such places because restricted to the use of afflicted humanity. The waters are especially invigorating and pleasant to the taste, the temperature equable, and the air very bracing. We were at the foot of the cluster of great peaks

surrounding the monarch of the range. They are called "cones," however, the name "peak" being reserved for the one that towers above its companions. As we gaze upward the view that is spread out before the eye is of indescribable grandeur. The cones seem to pierce the very heavens. Their summits appear like needle points, and yet they are actually several acres in extent. They reach far above the "timber line," and the fringe of skirting trees, well up on their hoary necks, reminds one of the old-fashioned choker. But the great cones don't satisfy us. Where is the Peak? I am amazed that it is necessary to ask the question. The Sergeant notices my dismay, and kindly directs my attention to a snow-covered, truncated cone, forming the background of the cluster of cones, and says, "that is the Peak, sir." Its summit is lost in the clouds and is very rarely seen from the foot hills. The immensity of this great Peak slowly dawned upon me, and my mind was absorbed in vain endeavors to compass its dimensions, for no true conception of its magnitude can be formed until the summit is reached and the observer, in astonishment, casts about him to find what has become of those monster cones which first caught the eye and came well nigh deceiving him as to their identity.

The mules became more sedate and thoughtful as we began the ascent of the long and narrow trail. I noticed that we were slowly rising on the mountain side and that the trail was narrowing down to a mere "cow path," and finally to a sheep's path, if it is proper to call a streak through the grass by such a name. I realized that all thoughts of grand scenery, rushing waters, and all that sort of thing were being rapidly replaced by considerations as to the size of the mule's feet, the weight of his ears, the location of the centre of gravity of the mule and his rider, and whether the rider had better stay on or get off. In this reverie of despair a call from the Sergeant startled me. I tried to look about and answer him, but to my horror I found that the mule was walking what appeared to be a tight rope, spanning a gorge, the depths of which appeared to be unfathomable. I didn't turn and it was well that I refrained from that exercise, for the noble animal was using the utmost precaution in placing one foot before the other, while crossing a narrow log that constituted that portion of the trail. After crossing, the Sergeant called a halt and advised that I allow the reins to rest upon the neck of the mule and give my entire attention to preserving a good balance and maintaining a quiet seat. There were many more difficult places to come before we reached the "Half-way House," and the mules were perfectly familiar with the entire trail, having "packed" many a bundle of freight over it for the Signal

Station at the summit. We changed about, the Sergeant taking the lead. If any trouble occurred, it was arranged that one or the other of us, as might be necessary, should call out and briefly state the facts, followed by such directions as the exigency demanded. But in no case were we to turn about in our seats, or otherwise disturb the equanimity of the mules, for all safety depended on their steady nerve and quick movement.

We had proceeded but a short distance, on the resumption of our journey, when the thunder crashed among the rocks and trees, "rain descended and the floods came." The lightning played about us with the wildest freaks, my body tingled with pricking sensations, and I could draw slight sparks from the iron trimmings of the saddle. The mules were perfectly unconcerned, to all outward appearances, which was extremely fortunate for us, but they had "been there before" and realized that the trail required more of their attention than these atmospheric side shows. The rain changed to sleet and finally to hail, and in about fifteen minutes we had passed through, and rose above the storm clouds into the sunshine, which revealed, in a startling manner, the dark and threatening appearance below us. It was a sight to be seen but not described.

Jogging along the trail which winds in and out along the banks of a rugged gulch, with our eyes alert for obstacles, we reached the "Half-way House" in the shadows of evening. This gulch imprisons a beautiful mountain stream which dashes over the rocks with a roar and throws its spray first on one side and then on the other. At several points in the ascent we passed waterfalls of considerable size and of great beauty. Once or twice the prismatic colors were gorgeously exhibited on the rising mist from the falls, as the sun's rays strained through it. At some places the trail was so narrow and precipitous that the mules slowed down to a snail's pace and with the utmost deliberation placed one foot before the other, while every muscle in their bodies seemed to be quivering under the great tension. On one side of the trail my hand and foot grazed the mountain side, while, on the other, they were suspended over an apparently bottomless abyss. I did not dare to fathom it with the eye, but I could hear the low gurgling of the water, like the rumbling of distant thunder, as it rushed along the bed of this mighty canyon. Sometimes my mule halted and, extending one foot, pressed it gently upon the ground to test its firmness, swaying the body slightly toward the mountain to keep his load well balanced. I remained perfectly quiet in my seat, except to change the inclination of the

body to conform to the motions of my intelligent beast. After passing these dangerous places the mules would stop and try to recover from the great exertions they had been making. The perspiration would appear on their bodies and a general relaxation of the muscles follow, which plainly indicated the severity of the trial. We patted their necks and spoke kindly to them, and by a backward glance of the ace they seemed to acknowledge our appreciation of their arduous labors. All mules are not bad mules, or at least there are times when the bad ones may remove the stain of evil from their records. This burst of sympathy, however, does not warrant you in placing implicit confidence in these animals, at all times. They are liable at any opportunity to emphatically resent imaginary insults.

The "Half-way House," although located only about one-third the distance to the Peak, is deceitfully so called to encourage the weary tourist in the belief that half of his journey has been accomplished. It may be needless to tell you that this house is neither a winter nor a summer palace. Its accommodations are limited to the number of persons who can coil upon the floor of the log cabin, or hide themselves away in a large bundle of buffalo robes and horse blankets representing a bed, in one corner of the room. This mountain resort was presided over by a grizzly-faced, long-haired individual, who lived as a hermit the most of the year and eked out a scanty subsistence during the short summer, when tourists are daily passing to and fro and generally purchase some curio from him. We put up for the night, as it was useless to go ahead, having learned from the mountaineer that the snow was extremely heavy and the winds high. Up to this time our small arsenal of side arms had served no purpose except to burden us, but I was now to learn that they might be the means of saving life, as the rocks and timber secreted many a bear, wild-cat and mountain lion. We placed our mules in a comfortable log stable and then repaired to the cabin for a frugal repast. Our appetites, as you can imagine, were not very weak. We ate ravenously of whatever was presented, without any attempt at critical examination. Before retiring, the mountaineer regaled us with bloodthirsty stories of bear and lion hunts, hair-breadth escapes from snowslides, high winds and extreme cold. We also discussed the difficulties to be encountered on the morrow and the best way to overcome them. I became thoroughly convinced that there was no little trouble in store for us. The Sergeant did not seem very talkative and I could see that his mind was fixed upon something outside of the cabin. He was evidently pondering over the problem which we

must solve before the following night pulled its shadows over us. It was agreed that we must make a very early start on the morrow and that we should try and get as much rest as possible to prepare for the coming struggle. So we "turned in" on that pile of buffalo robes, bear skins, horse blankets, etc., in the corner of the room, dispensing with all unnecessary toilet preparations.

It was a novel experience and I was not tired enough to be perfectly oblivious of my surroundings. Morpheus could not control me except by snatches of sleep. My thoughts flitted from one thing to another and finally rested upon the probability of coming into bodily contact with one of those monstrous mountain rodents which our host had been spinning pretty large yarns about. I had just arrived at the conclusion that his statements were hardly creditable, when I was startled by a crash that seemed to shake the cabin. Upon recovering my senses, I discovered that the Sergeant was shaking as if he had the ague. I first thought that he was completely overcome by fright, but in a moment realized that the source of his disturbance was an attempt to suppress laughter. Just as he was about to explain the situation there came another crash, followed by thumping leaps from one side of the room to the other. The Sergeant called out "Mountain rats!" and then I quietly subsided. The crash was due to their running along the pantry shelves, in the kitchen, and knocking off every culinary utensil on the floor. These mountain rats have webbed legs, like the flying squirrel, and are of enormous size. They can survive the coldest weather and are found in great numbers on the Peak.

At 6:30 in the morning we were ready for a renewal of the journey. We first held a consultation, the mountaineer being invited to join in the discussion, to determine whether it was best to go on foot or use the mules. It was finally decided to employ the mules as long as possible and then send them back to the "Half-way House" in care of the mountaineer. For about four miles the trail passed over a high table-land, completely encircled by towering cones, which had the appearance of having been, in past ages, the bed of a mountain lake. A portion of it was covered with wiry grass and the remainder with bushes and various kinds of stunted pine. There was little or no snow on the grassy portion, but upon entering the timber it was all about us and rapidly increased in depth as we advanced. We soon lost the trail and then almost immediately the mules became unmanageable and, in plunging about, sank into the snow up to their necks. They came near dragging us down the mountain side before it was possible to extricate them, and

the entire "outfit" was pretty thoroughly demoralized by the time the advance movement was again taken up. We bade an affectionate good-bye to the dear old mules, as they started back with the mountaineer to await our return to the "Half-way House," providing we lived to get back. The Sergeant gathered together our equipments and gave instructions as to how the pikes and snowshoes were to be used and what precautions were to be observed regarding the presence and possible attack from wild animals. We cast another look after the mules, which were now almost lost from view, and then turned our gaze upward and marched onward.

Snow in front of us, snow to the right of us, snow to the left of us gathered and deepened. We pressed forward, the Sergeant taking the lead, but progress was made with the utmost difficulty. Occasionally the crusted snow would possess sufficient strength to support our weight, but more often we were floundering in it up to our arm-pits. The wind howled through the tall pines, with a noise that fairly deafened us. We might have been pounced upon by wild animals, without the least warning, for the raging storm completely overwhelmed every other disturbance, and, moreover, we were nearly buried out of sight in the tremendous depth of snow. We could see, from where it encircled the bodies of the trees, that it was over thirty feet deep. When we left the timber we came out upon a perfect sea of snow. Its surface appeared as smooth as glass and, owing to the very precipitous inclination of the mountain at this point, the chances of crossing with safety looked very small. Looking upward we could not discern the limit of this white and treacherous waste of congealed moisture, and, casting our eyes downward, it appeared as though the bottom had fallen out of the earth below, and that we stood on a slender arch supported in some mysterious manner, the efficiency of which might terminate at any moment. The Sergeant explained that this part of the Peak was called Windy Point, because the air always moved with great velocity over the smoothly curved ridge which forms a perfect turtle back, with the major axis enormously lengthened. It had the appearance of a huge cigar and we were compelled to cross at the greatest diameter.

The Sergeant said that along this turtle back occurred some of the most destructive snowslides on the Peak. In fact, the ground had been swept perfectly smooth by them, the largest boulders being gouged out of their beds and all trees, of whatever size, uprooted or broken off, the whole mass being carried down the mountain side with a rush and a roar that was awful to witness and quite impossible to de-

scribe. Nearly every year lives are lost in these terrible avalanches, and death generally occurs from suffocation. The Sergeant admitted that it was extremely dangerous and that breaking the crust, as we passed along, might start a slide which, of course, meant certain death. The depth of snow he estimated at from forty to sixty feet over the turtle back, and it was therefore easy to see that, in case of a slide, the enormous mass would embrace thousands of tons weight and progress with irresistible force. I finally decided that go we must. It was like a frail bark casting off from the land upon a tempestuous and dangerous sea. It required over two hours to cross, but it seemed more like two days. At times we sank into the snow and would have disappeared beneath the surface had we not extended our arms, on either side, and buoyed up the body by pressing on the unbroken snow. Again, the surface would be found frozen sufficiently to bear our weight, but so icy that we had to cut places for our feet from one step to another. To have made one slip in crossing this treacherous place would have carried us down the mountain side to absolute destruction. Once, while floundering in the snow, we felt a pressure against our bodies from the mass above us, accompanied by peculiar cracking sounds that, to the Sergeant's practised ear, gave indications of a "snowslide." It was a moment of supreme peril and our fears were greatly aroused. The Sergeant advised absolute quiet and to remain motionless until every sign of a "slide" had subsided. It was a display of excellent discretion, for it afterward appeared plainly evident that, had we not stopped as we did, a fearful avalanche would have been occasioned.

Upon clearing Windy Point we came upon a sheltered side of the Peak, where the snow was quite thin, the rocks showing plainly through it. Here we lay down to rest because of almost complete exhaustion. But the Sergeant said that only a few moments could be spared for this recreation as the hardest part of the journey was yet before us. This statement was particularly depressing, in view of the fact that we had now reached the 12,000-foot level, and there remained but about 2,000 feet to scale. It was not accomplished, however, before I realized the truth of his assertion and in such a way as to leave an ineffaceable record on my memory. I now began to feel the effect of the rarified air. At first I smiled at the novel results, then became astonished, later alarmed, and finally almost recklessly indifferent as to my fate. To move twenty steps completely exhausted me and I would sink upon the ground quite unable to control myself. I was also getting benumbed with the dreadful cold, and we soon

arrived at a point where the wind struck us again with almost hurricane force, which was an additional and very serious impediment to our progress. The Sergeant led the way and braved the dangers with great heroism, but human nature, however molded, has a limit beyond which it cannot survive. He appealed to me and said that I must not again recline upon the ground, or even assume a sitting posture, because I might easily become too helpless to aid myself and it would be utterly impossible for him to assist me, as he must husband his strength to safely guide the way. I readily assented to this plan and approved the Sergeant's good judgment. My Alpine pike now became indispensable, for, when exhausted, I rested upon it in a standing posture. We now passed along the edge of the Great Crater and left behind us the limit of vegetation. Nothing but dark, volcanic rock, surrounded us on every side; not in solid, compact masses, but in broken pieces of all sizes and shapes, lying about in utmost confusion, as if distributed by recent volcanic action. What a struggle to make headway over these jagged rocks, and especially as we were going almost directly upward. It was a time when I felt as if the mercurial barometer strapped to my back would drag me down to destruction. We were reaching the summit by a circuitous course in order to avoid an almost perpendicular ascent, which we had not the strength to undertake.

As we left the Crater, dark clouds descended upon us like belchings from a live volcano and for a time the darkness was so intense that further progress was impossible. The terrible silence all about us, only broken by the rushing sound of the wind, coupled with the peculiar apparition of the clouds, made the scene one of awful grandeur. Soon the clouds lightened and then came a blinding snowstorm, such as is only seen on high mountain peaks. We could not see ten yards from us, and it was absolutely necessary to keep within that distance of each other and then, when one stopped, to call out to the other to do the same. We must push on as fast as possible, for it was getting very late and, although only about 500 feet more remained to ascend, a detour of about one mile was necessary in order to reach the station. On getting nearer to the summit the snow changed into sleet and hail, the pellets being jagged pieces of ice which cut the face like a knife. From this point to the door of the station we faced this terrible musketry of ice, our bodies encased in it and our faces bleeding at every step. Within a short distance of the station building I became partially unconscious and did not regain full control of my senses until about half an hour afterward, when I found myself on a

bed with men surrounding me, actively engaged in cutting off the wrappings about my legs and feet. Pretty soon I was in a burning fever with great pains in the abdomen and chest. I requested the Sergeant, who, in spite of his exhaustion, insisted upon attending me, to place his knees, one upon my chest and the other upon my stomach, resting his entire weight thereon. By catching hold of the sides of the bed he could press down with still greater force, and the more the better, for it seemed to smother the consuming fire within me. The usual remedies for mountain fever were administered and in about eighteen hours I was able to take some food, but it was not in the least a pleasure to me. Although remaining on the summit about two days I did not regain my appetite. As soon as I could leave my bed and walk about easily I placed my barometer in position and made the required comparative readings with the station instruments. On the second day I was able to go outside of the building and make a survey of the surroundings, examine the instruments on the roof and the general condition of all government property at the station.

The station building is about thirty by fifty feet, one story high, built of solid masonry with walls four feet in thickness. Passing over the roof in several places and imbedded in the solid rock on either side are large wrought-iron rods, to steady the building in case of heavy winds. The building contains four large, comfortable rooms, the interior of each being completely finished in hardwood. There are double windows and doors and every precaution taken to protect the inmates from the extremes of weather. The station building and appurtenances cost about $7,000. Wood alone is used for fuel and costs, delivered at the door, from $30 to $40 a cord. It is secured with great difficulty, as it must be brought from the "timber line," 2,000 to 3,000 feet below the summit, on the backs of small donkeys who are trained to do the work, but cannot carry more than three four-foot sticks at a time. It requires a caravan of these patient little animals to work steadily from two to three months in the summer, in order to place at the station the necessary fuel for the year.

The summit of the Peak is an oblong area, 2,000 feet in length and varying in width from 100 to 500 feet. It lies within the U. S. Military Reservation and largely to the north-west corner of it. The Reservation averages about 5,000 feet in length by 3,500 feet in breadth, and embraces a number of cones and spurs. Pike's Peak rises very abruptly from the eastward, and the open plain extending in that direction affords unusual advantages for noting cloud and

storm phenomena which originate or move eastward of the mountain. Even the cones to the westward are enough lower to permit observations of storm and cloud conditions below the level of the Observer on the Peak. A very extensive view ot the surrounding country can be had from the Peak, especially to the eastward, in which direction the outlook is estimated to extend 150 miles. The following peaks can be readily discerned from the Signal Station with the aid of a glass: Fisher's, S. 15° E. 124 miles; Long's, W. 72° N. 102 miles; West Spanish, S. 2° E. 101 miles; Ouray, S. 66° W. 70 miles; Harvard, W. 5° N. 69 miles. This record will give some conception of the wonderful view from the summit of this monarch of the Rockies.

The storms of wind, rain, hail, sleet and snow which pass over and below the level of the summit open to observation and study atmospheric changes which cannot otherwise be investigated except at similar elevations, either in captive balloons, on high structures like the Eiffel tower, or on mountain peaks. Observations made in the higher air currents are of especial value in relation to some of the duties of practical meteorology, and the acknowledgment of this fact gave stimulus to the efforts of the Signal Service in the establishment of the Pike's Peak and Mount Washington stations, the former in July, 1873, and the latter in December, 1870. At both of these stations a separate set of observations was made simultaneously at the base and summit, in order that comparisons could be made to determine the direct effect of the extreme difference in elevation. One of the most interesting and useful problems in meteorology, which the observations at high stations permit an intelligent discussion of, is the retardation of the maxima and minima of air pressure, according to elevation above sea level.

Prof. Loomis in 1879 advanced certain evidence to show that, apparently, the progress of a storm center was much more rapid at the surface of the earth than at elevations above it. Many arguments have been advanced by others for and against this theory. Over the United States both the maxima and minima of accidental fluctuations of atmospheric pressure generally occur, first, near the surface of the earth, and they occur later as we rise above the surface, the retardation amounting to one hour for an elevation of from 900 to 1,300 feet. The diurnal movements of the barometer exhibit a peculiarity similar to that found for the accidental fluctuations. The principal maximum occurs at the base at 8:30 A. M., but on the summit it does not occur until noon, being a retardation of $3\frac{1}{2}$ hours, which is almost identically the same as has been found by a comparison

of the accidental fluctuations. The mountain observations have also been very useful in determining the diminution of temperature with altitude. They have also been employed to explain that the variations of barometric pressure must be taken into account when accuracy of results in the determination of the humidity of the air is required.

In the total eclipse of July 29, 1878, remarkable observations were made from the summit of the Peak, on the extent of the corona.

During the inspection of the station it was my good fortune to witness one of the most interesting and remarkable phenomena to be observed from the Peak, viz.: the shadow or profile cast by it as the sun disappears at the western horizon. The image was very realistic, so much so that one could hardly credit the fact that it was merely a shadow and not a lofty peak rising abruptly from the prairie. It continued in good form for the space of about fifteen minutes, when it gradually melted away in the mist as the sun was setting behind the gigantic peaks of the Snowy Range. The apparent upstanding of the shadow was simply the effect of passing mist which caught the darkness of the Peak at a higher level than the earth, for, as the condensed vapor moved on in the current which was carrying it, the shadow fell to its natural plane on the ground. When the mist was low the shadow fell on top of it, as it were, and there was no appearance of lifting. These shadows have been observed from the summit of Adam's Peak, on the Island of Ceylon, but at sunrise instead of sunset, because the light mists form there most favorably on the approach of early morning sun. When the sun shines out very brightly the characteristic prismatic colors are seen in the form of circular bows more or less well defined. The theory is that white light reflected from water globules forms a series of prismatic bows or bands, according to the size of the globules, their closeness and the brightness of the illumination. The sunset shadow has also been observed from the peak of Teneriffe.

Pike's Peak is celebrated for its electrical storms, which occur only when the air is quite moist. The most favorable condition is during the time a light snow is falling. When the hands are held up sparks emanate from the tips of the fingers. At such times, with considerable wind, the anemometer cups look like a circle of fire. Each flake of snow as it alights on a mule's back gives a spark like a fire bug. The station has only once been struck by lightning. The electricity came down the anemometer rod, following the wire running to the battery. At every place where the wire crossed a nail, the

head of the nail was fused, and the wire melted at the same point. Prolonged wind storms are unusual on Pike's Peak and the days are comparatively infrequent when the mean hourly velocity equals or exceeds fifty miles per hour. The most remarkable wind storms were those of September 28–29, 1878, when the mean velocity was seventy miles per hour. The highest extreme velocity, 112 miles per hour, occurred May 11, 1881. Higher velocities have frequently been observed at exposed points on the Pacific and Atlantic coasts. The daily range of temperature shows a maximum of 14° in July and September and a minimum of 11° in December. The mean daily range on the Peak is only about one-half of that which obtains on the low plateau country to the eastward. The mean annual temperature is 19.3° with an extreme range of 4°, the minimum occurring in 1880 and the maximum in 1879.

Gen. Greely has shown that the actual atmospheric pressure at Rocky Mountain stations, above 4,000 feet, attains its minimum in January and its maximum in July or August, and that the barometric phases are of the same sign, with reference to the annual mean, as the temperature phases at such stations. On Pike's Peak the curves of temperature and pressure are not only alike in having a single bend, but the maximum phase of both occurs in July and the minimum in January. Not only are these elements coincident in their extreme phases, but the annual march is the same, so that the two curves are not only parallel, but almost identical.

In conclusion: I have kept you at the summit long enough, while presenting some of the peculiarities of this great mountain meteorological station, and you will pardon me if I now let you down rather abruptly, by saying that the trip downward was more rapid than the ascent, less dangerous, as a whole, but quite as irksome. We completed the descent in one day, starting in a snowstorm and passing successively through storms of sleet, hail, rain and thunder, terminating with a clear sky and warm sunshine at Colorado Springs.

PAPER CURRENCY.

BY SIDNEY W. ROWELL.

[Read before the Albany Institute April 1, 1890.]

In a paper which I read before the Institute about one year since, an attempt was made to give an account of the different plans which have been tried for the purpose of making settlements in commercial transactions. A list of the commodities which have been used as money was given, and the difficulties experienced in attempting to use sundry commodities as money were noticed. The conclusion arrived at was that gold and silver are the best-known commodities for use as money, but that they fall short of being ideal money; that the world is in need of, and is looking for "perfect money." As was stated at the time, the paper currency question was purposely omitted, because it could not be brought within the time limit put on that paper.

Some people have an idea that all kinds of financial difficulties can be overcome with an unlimited issue of paper currency; and it will be the purpose of this paper to review the history of paper currency, to call attention to the dangers which threaten a country when the government issues the currency and the amount is under the immediate control of its legislative bodies, and to show how rudderless people sometimes are when they have to deal with serious financial problems.

There always has been, still is, and probably always will be a difference of opinion among economists, as to whether it is better to have convertible paper money at all, or do our business wholly with metallic money. A large amount of ink, paper and valuable time has been devoted to the discussion of this question. It must be admitted that good arguments have been made on both sides, but neither side has been able to make it perfectly clear that it is a one-sided question.

At certain seasons of the year there is need of a greater amount of currency than there is at others. When the cotton, the wool, the grain and other crops are being marketed, something must be provided to make settlements with. Manufacturing enterprises, too, vary in their needs, just in proportion to the activity of their business. Then

active seasons are followed by a season of settlements among the people, and a gradual return of the currency, through the various channels of trade, to the money centers, for redemption at the place from which it was issued.

The issuing of notes or paper currency by a bank, for which law and custom have secured public confidence and a superior credit, in exchange for the notes made by an individual, firm or corporation, makes it possible to expand and contract the circulating medium with facility, at a small cost; to transact business with credits and with the least possible use of metallic money.

If we were to use only metallic money in transacting business, there would be no such thing as adapting the supply to the demand. The volume would be the same in spring, summer, fall and winter. During the active seasons there would be a short supply, and at other times a surplus which could not be profitably used, and which would be a dead weight for a part of the people to carry. The constant use of coin every time a settlement is made, reduces its weight, its value and a wasting of a portion of the world's supply of the precious metals.

At times business transactions make it necessary for men to carry large sums of money on their person, and by remembering that $1,000 in gold weighs about three and three-fourths pounds avoirdupois, and the same sum in silver weighs about fifty-nine pounds, we get something of an idea of how inconvenient the exclusive use of coin would be.*

There are two kinds of paper currency: the *convertible,* which is issued under proper restrictions, and is redeemed in coin at the will of the holder; and the *inconvertible,* which is generally issued by a government, without there being any provision made for its conversion into coin.

The only excuse offered for issuing inconvertible paper currency is that it is for temporary need — possibly a war measure.

This kind of "fiat" money has been tried a great many times, but I have never heard of any practical good which came from its issue. I am told that there is in the Asiatic Museum at St. Petersburg, a specimen of a paper currency issued by the Chinese government as early as 2697 B. C., and its common name was "flying money." This relic of three thousand two hundred years ago, was probably written by hand, as the earliest record of printing among the Mongolians was 160 A. D., when the use of wooden tablets was introduced into China. This note bears

---

*One million dollars in gold coin requires nearly seventeen cubic feet of space; $1,000,000 in silver dollars requires nearly two hundred and fifty cubic feet of space; $5,000 in silver dollars requires a space twelve inches by nine inches by four inches.

the name of the Imperial Bank; its date corresponds to 1399 B. C.; on it is the number of its issue and a list of the penalties for forgery of the notes, and it is authenticated by the signature of a mandarin. Therefore, the issuing of paper money was, probably, original with the Chinese.

In the year 1294 the Persians had paper money, adopting the copy set them by the Chinese.

In the fourteenth century the Japanese thought they would try the system. All of these issues of paper currency resulted in a disregard of the good of the people, the loss of many official heads, and a discontinuance of the system for a time. But these serious lessons did not prevent later rulers from adopting the same measures and suffering the same consequences.

Inconvertible paper money has a fascination about it which is almost resistless to those who wish to get something out of somebody without giving an equivalent. Its history is a checkered one, and for our purposes it is not desirable to wade through it all, because the advocates of "fiat" money always argue that the times have changed and that the dim past should not be referred to for rules for our guidance in this matter at the present time. Therefore, let us pass over a considerable period and renew our investigation when the world had become wiser and administered the affairs of state in a more intelligent manner.

The history of France is rich in material for illustrating the effect of inconvertible paper currency, and we will turn our attention to the time when Louis XV, who was then but five years of age, ascended the throne. The unscrupulous and dissolute Duke of Orleans, through his influence and control of the Regency, reduced the public treasury to the verge of bankruptcy. While the deplorable condition of the country's finances was being discussed, a Scotch adventurer, by the name of John Law, saw the opportunity to draw attention to himself and make some money. He conceived the plan of issuing paper currency by the government, with a fictitious basis. At that time, France owned, in North America, a tract of country, known as the Province of Louisiana, which in 1803 was bought by the United States of America for the sum of $15,000,000, and embraced all the country west of the Mississippi not occupied by Spain, as far north as British territory, and comprised the whole or most of the present States of Arkansas, Iowa, Kansas, Louisiana, Minnesota, Missouri, Nebraska, Colorado and Oregon, the Indian Territory, the Dakotas, Idaho, Montana, Washington and Wyoming

This province was far enough away and so little was known of it, that it was decided to declare that there were there extensive gold and diamond mines, all of which were pledged as security for the paper currency. This currency lifted the country out of its lamentable condition, the wildest kind of speculation prevailed, but at last the bubble burst and thousands were financially ruined.

Serious as this lesson was, its effects were eventually forgotten. In 1774, France was greatly agitated over the proposition to respond to the appeal for assistance, which was made by the North American colonies in their war with Great Britain. Some of the leading men in France thought it a good time to punish England and recover the territory and military prestige which had been lost in the last war.

The King, Louis XVI, who had succeeded his grandfather at the age of twenty years, was young and timid. And, although he was anxious to do what was best for the country, on account of embarassments inherited from previous rulers and the low condition of the public treasury, he hesitated and finally declined to assist the colonies. This caused much dissatisfaction and resulted in the imprisonment of such leading spirits as the young Marquis de La Fayette, who belonged to one of the most ancient and eminent families in the kingdom. He finally escaped into Spain, from thence to this country, and, although not quite twenty years of age, was, on July 31, 1777, commissioned as a major-general, without pay, in our army under Washington.

This little bit of history is thrown in, partly to show the origin and seriousness of the financial embarrassment of France in 1789, and partly as a reminder that we are considering a period contemporaneous with our own history.

France was called upon to provide for her expenses, which were far in excess of the usual revenues. In the Assembly, the finance committee recommended that the confiscated estates of the church and wealthy people who had left the country, be pledged as security for paper issues called *assignats*. During the discussion of the measure, attention was called to the country's experience with the paper currency issued seventy years before. But it was argued that circumstances had changed, and that with such men as Bailly, Necker and Mirabeau as leaders, no trouble could possibly arise from the issue of paper currency. The measure was hotly contested, but its friends were in the majority, and it was carried. The paper was issued, bearing interest, was payable on demand, and four hundred million francs were put in circulation. Business revived, prices advanced, the oppo-

nents of the measure were partially silenced by the relief obtained, and the general public thought it an easy way to pay debts. There was a call for more. Mirabeau, who had declared paper money to be the nursery of tyrants, corruption and delusion, ran his eye over the situation, saw that the movement was popular with the people, changed his course and expressed himself as follows:

"Paper money, we are told, will become superabundant. Of what paper do you speak? If of a paper without a solid basis, undoubtedly; if of one based on the firm foundation of landed property, never. * * * There cannot be a greater error than the fear, so generally prevalent, as to the over-issue of *assignats*. It is thus alone you will clear off our debts, pay our troops, advance the revolution. Re-absorbed progressively in the purchase of the national domains, the paper money can never become redundant, any more than the humidity of the atmosphere can become excessive, which descends in rills, finds the rivers, and is at length lost in the mighty ocean."

The debate was most vigorous, but the tide of public opinion was running toward favoring the adoption of the bill. All the opposition could do was to have a stipulation inserted that no further issues should be made. In September, 1790, the Assembly, by a vote of 508 to 423 passed the bill for a further issue of eight hundred million francs. Notwithstanding the stipulation that there should be no further issues, the paper money infatuation had such control over the people that, during the next year, six hundred millions more were issued.

There must inevitably be an end to every debauch. One writer describes the situation as follows: "What the bigotry of Louis XIV, and the shiftlessness of Louis XV could not do in nearly a century, was accomplished by this tampering with the currency in a few months. Every thing which tariffs and custom-houses could do was done. Still the great manufactories of Normandy were closed; those of the rest of the kingdom speedily followed, and vast numbers of workingmen in all parts of the country were thrown out of employment. * * * "In the spring of 1791, no one knew whether a piece of paper money representing one hundred francs, would, a month later, have a purchasing power of one hundred francs, or ninety francs, or eighty, or sixty. The result was that capitalists declined to embark their means in business. Enterprise received a mortal blow. Demand for labor was still further diminished. The business of France dwindled to a mere living from hand to mouth. This state of things, too, while it bore heavily against the interests of the moneyed classes, was still more ruinous to those in moderate, and most of all to those in straightened circumstances."

From this it will be seen that a crisis was inevitable. The paper issues had been made without any regard to their redemption. The government was compelled to disregard the promise contained in the notes. Repudiation made matters desperate. It was thought by some that full value could be given the depreciated paper currency by legal enactment. A law was passed making every person who should purchase specie after April 11, 1793, liable to wear irons for six years. This law did not remedy the difficulty and, the following August, another law was passed which made the penalty for selling an *assignat* below its par value, twenty years in chains. But these laws did not seem to meet the difficulty or to have any good effect whatever. As a last resort it was made unlawful to send any capital out of France for investment in a foreign country, and any person found guilty of such an offense was punishable with death. Inasmuch as human law cannot follow a person after death, no further attempt to sustain the repudiated promises of the government by legal enactment, was made. But, notwithstanding all this, the depreciation of the paper currency and the flow of gold out of the country continued. In 1796, all the metallic money which the government could place under the control of General Bonaparte when he set out to take command of the army in Italy, was two thousand gold louis.

In the usual order of events, one would naturally suppose that, after the irredeemable promises of the government had brought such a terrible condition of affairs, no plan which was liable to repeat such a calamity would be seriously considered. But there were those who thought that the whole trouble could be overcome by issuing more promises. For the purpose of making the scheme more plausible and popular, it was decided to call the new issue "Territorial Mandates," make them convertible into land, on demand, and use them in part in redeeming *assignats* at 30 for 1. The plan had a brillant send-off, but in a few months confidence was gone, and its end was suicide. Paper issues had been tried and allowed to run their course to the very end. The ruin which had been caused, silenced the advocates of the unwise measures. Those having conservative views were able to get a respectful hearing. But people and law-makers became fully convinced that no good could come from an execution of the penal laws mentioned, and a decree was issued making it lawful for **every man to do business in the usual way.**

"No sooner (says Mr. McLeod, "Economical Philosophy") was this great blow struck at the paper currency, making it pass at its current value, than specie immediately re-appeared in circulation. Im-

mense hoards came forth from their hiding-places; goods and commodities of all sorts being very cheap, from the anxiety of their owners to possess money, caused immense sums to be imported from foreign countries. The exchanges immediately turned in favor of France, and in a short time a metallic currency was permanently restored. *And during all the terrific wars of Napoleon, the metallic standard was always maintained at full value.*"

The war in which France and England became involved in 1793, and which made such great demands on both countries, embarrassed the latter as well as the former, although at a little later period. Great Britain relied on the Bank of England for its financial assistance. The expenses of the war were so great that it was impossible for the bank to honor all the government's drafts and redeem its bills, in coin, on demand. On the 27th day of February, 1797, the Bank of England suspended specie payments. The result was the old story over again — loss of confidence, timidity of capital, suspension of business, low wages and high prices for food products (for particulars, see Martineau's History of England, vol. 1, p. 329). The people suffered till the cry for relief was so strong that the House of Commons was compelled to take action and, on the 8th of June, 1810, appointed a committee to "inquire into the high price of gold bullion, and to take into consideration the state of the circulating medium and of the exchanges between Great Britain and foreign parts."

The report of the committee was most exhaustive and to the student of finance is an interesting document. The following is Prof. Sumner's digest of it:

"1. The value of an inconvertible currency depends on its *amount* relatively to the needs of the country for a circulating medium (only to a very subordinate degree on the security on which it is based, or the credit of the issuer).

"2. If gold is at a premium in paper, the paper is redundant and depreciated.

"3. The limit of possible fluctuation in the exchanges, is the expense of transmitting bullion from the one country to the other. If it costs two per cent to transmit bullion, the fluctuations of the exchange due to the ratio of imports and exports never can exceed two per cent above or below par. Par of exchange is the par of the metals, weight for weight, in the two coinages.

"4. If there is a drain of the precious metals, it is due, aside from exportations to purchase food or pay armies, etc., to the presence of an inferior currency of some sort in the country it leaves.

"5. If the inferior currency be removed, the exchanges will be turned, the outflow will stop, and, if any vacuum is created, gold will flow in to supply it. Gold will not flow in while the inferior currency fills the channels of circulation.

"6. The amount of gold in the world will suffice to perform the exchanges of the world. If there be more or less, it will only affect the average level of prices, the world over.

"Every nation will have that portion of the stock of gold in the world, which is proportioned to its trade. Each nation will have just as much as it needs.

"A better and a worse currency cannot circulate together. The worse will drive out the better.

"The committee also, incidentally, condemn the usury laws, and the law forbidding the exportation of the precious metals."

This report gave the people something to talk about; but not till after the commercial crisis of 1818 was any real, honest work done in the direction of a resumption of specie payments.

Finally, the Bank of England was authorized by law to establish a scale of prices for gold in exchange for its notes. In October, 1820, the bank began to redeem its notes, the rate being changed from time to time till May, 1823, when the amount of the notes outstanding had been reduced, so that they were redeemed at full value. Resumption was accomplished.

The events in English history which we have been reviewing occurred during the latter part of the reign of George III, which was from 1760 to 1820, the longest in English history.

Russia, Austria, Italy and other countries have had their experience with "fiat" money. A review would show the same results which have been illustrated, and we will pass on to consider the career of this paper delusion in the United States.

About the earliest issue of paper currency in this country was in 1690 and by the colony of Massachusetts, which had sent an expedition into Canada and paid the soldiers in paper promises. The other colonies thought that the issuing of paper currency was a bright idea and adopted the plan. In those days, business was not very active. Communication between different points was slow and irregular. The currency was used, with varying success, till 1748, when all New England, New York, Pennsylvania, Maryland, North Carolina, South Carolina and Virginia, found that more of their paper was presented for redemption than they had provided for. Business was unsettled. Whenever any thing was offered for sale, before a price was fixed, the

seller must know how the purchaser proposed to pay. The merchant had four prices for his goods, "pay" "pay as money," "money," and "trusting." It was understood that "pay" meant barter, at a rate fixed by the government. "Pay as money" meant barter with a reduction of one-third below the government rate. "Money" meant Spanish or New England coin. "Trusting" meant that the price was to be increased according to the time given.

Under such a condition of affairs it is easy to understand how there must have been considerable friction in doing business. The troubles reached such proportions that in 1763 Parliament interfered and declared all colonial acts authorizing the issue of paper money, void. Ten years later, however, Parliament was prevailed upon to make the bills a legal tender in the settlement of obligations at the treasury of the colony issuing the same.

Conspicuous among the names of those who had espoused the cause of paper money, we find that of Benjamin Franklin. He disapproved of the act of Parliament in 1763, and published a pamphlet, in which he contended that "any well-founded credit is as much an equivalent as gold or silver." Later we find him urging upon the Continental Congress the passage of the bill authorizing the issue of Continental paper money, *based on a virtual mortgage of the whole continent.* It was claimed that this was "the safest possible currency." In May, 1775, it was ordered; and, the following August, $300,000 of paper money, made redeemable in gold or silver in three years after date, was issued, and was exchanged for an equal amount of Spanish dollars. This issue was such a success that other issues followed; and when $9,000,000 were in circulation, with no prospect of stopping the business, depreciation commenced. For one year these issues were kept on a par with gold; in two years it took two dollars of paper to equal one of gold; in three years their relative value was 4 for 1; in nine months more, 10 for 1; in September, 1779, it was 20 for 1, when Congress decided that the total issue should not exceed two hundred millions, and, in its wisdom, passed a resolution declaring that the paper was not depreciated, and that the difference between the value of paper and gold was simply owing to an advance in the value of the latter. The government undertook to sustain the bills by adopting harsh measures. Public meetings were held, and those who were in favor of metallic money were denounced in unmeasured terms.

The following is a copy of a hand-bill which was circulated as its date indicates.

SONS OF BOSTON! SLEEP NO LONGER!

WEDNESDAY, June 16, 1779.

You are requested to meet on the floor of the *Old South Meeting-House* to-morrow morning, at 9 o'clock, at which time the bell will ring.

Rouse and catch the Philadelphia spirit, rid the community of those monopolizers and extortioners, who, like canker-worms, are gnawing at your vitals. They are reducing the currency to waste-paper by refusing to take it for many articles. The infection is dangerous. We have borne with such wretches; but will bear no longer. Public example at this time would be a public benefit. You, then, that have articles to sell, lower your prices; you that have houses to let, refuse not the currency for rent; for, inspired with the spirit of those heroes and patriots who have struggled and bled for their country, and moved with the cries and distress of the widow, the orphan, and the necessitous, Boston shall no longer be your place of security. Ye inhabitants of Nantucket, who first introduced the accursed crime of refusing paper money, quit the place, or destruction shall attend your property, and your persons be the object of vengeance.

N. B. Lawyers, keep yourselves to yourselves.

But terrorism could not give economic force to a currency, the redemption of which was questionable. The abundance of this paper money made it of little value, and it was the old story over again. All the noble sentiments respecting public faith, which had been uttered by the government, were forgotten or ignored, and a scaling down plan of redemption was adopted. Judge Story in his "Commentaries on the Constitution," tells us what became of these bills:

"In March, 1780, the States were required to bring in the bills at *forty for one;* and new bills were then to be issued in lieu of them, bearing an interest of five per cent, redeemable in six years, to be issued on the credit of the individual States and guaranteed by the United States. This new scheme of finance was equally unavailing. Few of the old bills were brought in, and, of course, few of the new were issued. At last the continental bills became of so little value that they ceased to circulate and, in the course of the year 1780, they quietly died in the hands of their possessors. Thus were redeemed the solemn pledges of the national government! Thus was a paper currency, which was declared to be equal to gold and silver, suffered to perish in the hands of persons compelled to take it, and the very enormity of

the wrong made the ground of an abandonment of every attempt to redress it."

The amount of paper money actually issued under the act referred to, is somewhat in doubt. The limit was two hundred millions; Joseph Nourse, who was register of the treasury in 1828, places the amount at $241,552,780, and the amount given in the treasury statement of 1843 was $242,100,176. The aggregate loss to the people of the country from the currency issued was estimated by Secretary Woodbury, to be $196,000,000.

It is generally supposed that the holder of a bond or any other obligation issued by the government holds something which is secured by a first mortgage on all the property in the country; but in case of a failure on the part of the government to provide for both the interest and the principal of any of its outstanding obligations, the holder has no remedy by a suit at law, and cannot enforce his claim any more than as though his claim was against the late Confederate States. All he can do is to supplicate the favor of the government — a mode of collection which the holders of continental money found to be an unreliable power.*

Peletiah Webster in his "Political Essays" (Phila. 1791), says of the continental paper money: "We have suffered more from this cause than from every other cause or calamity. It has killed more men, pervaded and corrupted the choicest interests of our country more, and done more injustice than even the arms and artifices of our enemy. If it saved the State, it has also polluted the equity of our laws, corrupted the justice of public administration, destroyed the fortunes of thousands who had most confidence in it, enervated the trade, husbandry, and manufactures of our country, and went far to destroy the morality of our people."

A careful review of the situation clearly proves that the statement is not too strongly drawn. Business was completely demoralized. Men seemed to have lost confidence in each other. Commercial honor had gone out of fashion, and breaches of trust were the rule.

These experiences were so trying and bitter that, in 1787, when the Federal Constitution was framed, there was a strong feeling in favor of a provision which should prohibit the issuing of paper money by a State or the general government. Washington, Jefferson, Madison and most of the other distinguished patriots, talked, wrote and otherwise used their influence in favor of such a provision. But there were

* No obligation or contract entered into by the United States or an individual State, under a law duly passed, can be enforced by any legal process.—Pub. Debts, Adams, p. 291.

those who held opposite views, and Rhode Island was not represented in the constitutional convention. It was desirable to have harmony, so it was decided not to prohibit the issue of paper money, in express terms, but to make it clear that the Constitution did not authorize it. The only authority given Congress to legislate respecting a currency is found in two sections. Section 10 says: "No State shall * * * coin money, emit bills of credit, make any thing but gold and silver coin a tender in payment of debts, etc." Section 8, clause 5, says: "The Congress shall have power * * * to coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures."

In speaking of the powers of Congress, in 1831, Mr. Gallatin said: "As this body has no authority to make any thing whatever but gold and silver a tender in payment of private debts, it necessarily follows that nothing but gold and silver coin can be a legal tender for that purpose, and that Congress cannot authorize the payment, in any species of paper currency, of any other debts but those due to the United States."

In 1836 Daniel Webster, that mental giant, defender and expounder of the Constitution, gave his views in the following words:

"Most unquestionably there is no legal tender, and there can be no legal tender in this country, but gold and silver, either coinage of our own mints or foreign coins, at rates regulated by Congress. This is a constitutional principle, perfectly plain, and of the highest importance. The States are expressly prohibited from making any thing but gold and silver a tender in payment of debts; and although no such prohibition is applied to Congress in express terms, *yet Congress has no power granted to it in this respect, but to coin money and regulate the value of foreign coins.*"

Such was the prevailing opinion down to 1860, when secession was threatened, and the government needed more money than the usual revenues would provide. It was the old story over again — an emergency, not to be governed by the teachings of history, precedent or the Constitution. The active spirits in Congress thought that the great and unexpected expenditures of the government should be provided for, in part, by taxation and loans, and, in part, by paper currency. It was claimed that, under the second clause of the eighth section of the Constitution, which gives Congress the power "to borrow money on the credit of the United States," circulating notes could be issued. The measures introduced for the authorization of circulating notes were vigorously fought, in the Senate by Judge Collamer and in the

House by Justin S. Morrill — both from Vermont. But the bill met with popular favor and its passage authorized the issue of $150,000,000 of *legal tender* notes. Another issue of $150,000,000 was authorized on the 11th of July. On the 3d of March, 1863, $150,000,000 more was authorized, making a total issue of $450,000,000.

The first issue put gold at a premium. With each issue the premium advanced. The future seemed so uncertain that no one ventured to guess what it might bring forth. Our credit was gone in every foreign money market. In 1864, gold sold for one hundred and fifty per cent premium. Congress realized that something must be done to prevent the government's credit from being wholly thrown away. On June 30 an act was passed declaring that at no time should the total amount of United States notes exceed the amount already issued. The total amount issued on January 30, 1864, which acted more or less as currency, was $1,125,877,034 — $812,000,000 of which did not bear interest. But inasmuch as the government could disregard its promises, leaving the holders perfectly helpless, the declaration did not strengthen its credit. The premium on gold continued to increase till July, when it reached one hundred and eighty-five per cent premium. We say that gold was at a premium, because that form of expression is better understood. The correct statement is that the paper currency was depreciated, and that "greenbacks" were worth only thirty-five cents on the dollar.

By the issuing of so much paper currency, the government went deliberately to work to raise the price of every thing purchased to carry on the war with, and to reduce the value of the equivalent it received for its bonds, and the value of the revenue it received from nearly every source. It has been estimated by competent authority, that from the 15th day of April, 1861, when President Lincoln issued a call for seventy-five thousand men — which was three days after the attack on Fort Sumter — till about six months after General Lee's surrender at Appomattox, on April 9, 1865, a period of say four years and a half, the average expenses of the war were two millions of dollars each day.

In the period mentioned, there were one thousand six hundred and forty-two days, and if the expenses were two millions per day, the cost of the war, for that period, was three thousand two hundred and eighty-four millions of dollars ($3,284,000,000). A part of this expense was provided for by making loans amounting to $2,565,000,000, for which the government received a depreciated paper currency representing a gold value, estimated on the basis of quarterly reports, of but $1,705,000,000. On the average, the bonds were sold for a fraction

over sixty-six cents on the dollar. When the five per cent ten-forty bonds were marketed, gold was selling at from two hundred to two hundred and twenty, so that the government only realized for the bonds, from forty-five to fifty cents on the dollar. All those people who were living on a fixed income or salary were troubled to "make both ends meet" when the paper currency was so greatly depreciated.

The late E. G. Spaulding of Buffalo, N. Y., claimed to have originated the plan of issuing the legal-tender notes. I am unable to see any thing in the scheme to be proud of. If I were to make out a list of those whose acts multiplied the effects of the rebels' bullets, the name of the author of the legal-tender note scheme would be included. I have searched every thing at my disposal with a view of finding, if possible, a record of some permanent good which has come from the issuing of inconvertible paper money. The investigation develops nothing in its favor. The testimony against it is overwhelming.

The actions of a government which gets involved with paper money remind me of the story of the man who came from the Emerald Isle to this country and commenced work on a farm. One day he was told to go up the lane into the pasture and catch the old horse. He went as directed and caught the old horse by the tail. In consequence of this unusual proceeding, the old horse started down the lane on a run, throwing Patrick against the fence, first on one side and then on the the other. On arriving at the barn, Patrick found himself badly bruised and bleeding and, when asked why he did not let go, replied that it was all he could do to hold on.

This inconvertible paper currency delirium has been reviewed in rather a general way, but it is to be hoped that something has been said which may help all to a more perfect understanding of the question. Its agitation is liable to break out at any time. Notwithstanding the issuing of paper money is foreign to the purposes and functions of our government, there are those who are looking for an opportunity to advocate the plan of having the government furnish all the paper currency. Laws respecting a circulating medium are made and repealed, as often as the ever-changing minds of men deem it proper. This is not only true of the past, but it is what must be expected in the future. The people have not outgrown the habit of turning to the government for relief from business depression, which their extravagance, thoughtlessness and irregular business methods have brought about.

At the close of the war, Secretary McCulloch strongly advocated

the withdrawal of all the legal-tender notes. On the 12th of April, 1866, Congress passed a bill (83 to 53 in the House, and 32 to 7 in the Senate) adopting the Secretary's plan. As soon as the withdrawal began, speculation was checked, and the high prices which irredeemable currency had made, began to fall. In 1868 an act was passed suspending the law of 1866, and discontinuing the plan of redemption. People who had inventoried their property at high figures did not like to have prices go down. Nothing further was done till the panic of 1873 caused suffering Wall street to beg President Grant and Secretary of the Treasury Boutwell to open up communication between it and the treasury vaults. The effort resulted in the re-issuing of $26,000,000 of legal-tender notes, which had been retired as the law provided. This act was in violation of law; the notes had no legal existence whatever, and the act was an assumption of power which is a dangerous precedent. If such assumptions of power are tolerated, our executive officers will become the great stock operators in Wall street. Any man who could have been favored with the exclusive use of the information that such a course had been decided upon, thirty minutes in advance of its publication, could have made a large fortune.

Attention has been called to the powers given to Congress by the Constitution, to legislate respecting the currency, and the interpretation which our statesmen gave to those powers down to 1860. During the term of the Federal Supreme Court, in December, 1869, when there were eight judges on the bench (one vacancy) the legal-tender acts were declared unconstitutional. Soon after that decision, one of the judges who had concurred in it, resigned, thus making two vacancies. The President nominated and the Senate confirmed, as judges, two very able and worthy men whose opinions were known to be in favor of the legal-tender acts. At the December Term, 1870, another case was presented, the court reversed its former decision, and decided that the legal-tender acts were based on the war powers of Congress and were constitutional. In the first decision, five judges concurred and three dissented. In the second decision, five judges concurred and four dissented. The two new judges voted with the three who dissented from the first decision. In 1884, another case was decided by the Supreme Court, which settles every point which can be raised in favor of the constitutionality of legal-tender paper money. As the matter now stands, Congress has power to issue legal-tender circulating notes to an unlimited extent in time of peace as well as in a time of war. All reliance upon any constitutional in-

hibition to do any thing whatever with the currency which Congress may have a whim to do, must be abandoned.

And here my paper properly closes. But at the present time the attention of the people is called to the question of a paper currency, based on silver; and if you will bear with me for a few moments longer, I will say a few words in reference to that matter, promising to condense my remarks as much as is possible.

The law of February 28, 1878, known as the Bland bill, was passed over the veto of President Hayes, and coinage began in March — the month following the passage of the bill. Its provisions required that the silver dollar of 412½ grains, standard weight, should be coined at the rate of *at least* $2,000,000, and not more than $4,000,000, each month.

The people have not taken very kindly to the silver dollars, on account of their great weight and bulk; and a large proportion of them have been stored away in the government's vaults. They are the basis of, and are represented by what are known as "silver certificates," a paper currency issued by the government, which resembles other national currency; and probably a great many people do not know the difference between a silver certificate and a legal-tender note.

Just why there should be a law compelling the purchase of silver and the *coining* of at least $2,000,000 each month, for no purpose except to store them in government vaults, is more than I am able to explain. According to the report of the Secretary of the Treasury, on the 1st of November last (1889), there had been coined $343,638,001; it being understood that the government has not exceeded the minimum amount. (By adding two millions for each month since then, we can ascertain about the total coinage under the act.)

Of this amount $60,098,480 had been put in circulation. The larger part of the 283,539,521 silver dollars in the vaults of the treasury will probably remain there permanently, unless they are brought out for the purpose of being sold or recoined. The most persistent advocate of silver does not claim that any large amount of these dollars will be used in business transactions. If a man has a tender to make, he will use gold or legal-tender notes; because if he used silver, for every thousand dollars he had to pay, he would have to carry fifty-nine pounds of silver. The coinage of every silver dollar costs the government about two cents; and if the government must purchase the products of the mines, why is it necessary to incur the additional cost of useless coinage when it could be so much better stored in bars. For every hundred million manufactured, the cost of coinage is $2,000,000. In view of

the fact that the coin cannot be used, the expense of coinage is money thrown away.

At the present time the silver interest is a powerful one. It is too strong for either political party to cope with. Both parties try to secure its favor, and neither dares to incur its hostility. Ever since the passage of the Bland bill, both the Republican and the Democratic administrations have kept the monthly coinage of silver dollars down to the smallest sum possible and comply with the law. Three Republican Presidents — Hayes, Garfield and Arthur — and five Republican Secretaries of the Treasury succeeded each other in a solid line against silver, and only obeyed the mandatory provisions of the law. On the 24th of February, 1885, Mr. Cleveland published a letter, in which he unreservedly committed himself to opposition to silver, and in his first message to Congress, December 8, 1885, he recommended the repeal of the act making the coinage of two million silver dollars each month compulsory. His policy, as recommended and followed out, was precisely the same in this respect as that of the three Republican Presidents who preceded him.

The silver interest would not down. It was persistent and aggressive, demanded recognition, and in the Republican platform of 1888, it was written: "The Republican party is in favor of the use of both gold and silver as money, and condemns the policy of the Democratic administration in its efforts to demonetize silver."

The Democratic party, in trying to pacify the silver interest, did an equally inconsistent thing in nominating for Vice-President Mr. Thurman, who was a most open advocate of the free and unlimited coinage of silver.

The Republican candidates were elected; have been in office over a year; and have followed the policy pursued by the previous Republican and Democratic administrations, on the silver question. New States have been admitted into the Union. The friends of silver were never so strong in Congress as they are at the present time. The administration has been struggling with the question. It must meet the issue, no matter how disagreeable the task may be. Secretary Windom prepared a bill, and the Senate Finance Committee prepared another. Both of these bills are before Congress for consideration. From the amendments which have been made, it is clear that neither bill will pass in its original form.

I will attempt to give you some of the principal features, and a comparison of the two bills.

The Windom bill provides a way for the purchase, by the govern-

ment, of all the silver produced in the United States which is not used in the arts. The Senate bill provides for the investment by the government of $4,500,000, each month in silver, which, at the present price, would purchase fifty-seven millions four hundred and forty-six thousand eight hundred ounces each year. From the best information obtainable, it is estimated that the production last year, in the United States, was the largest on record, and amounted to fifty-four million, seven hundred and fifty thousand ounces. After deducting eight million five hundred thousand ounces, the amount estimated for use in the arts, there will remain forty-six million, two hundred and fifty thousand ounces. Consequently, at the present price for silver, the bill would oblige the government to purchase eleven million, one hundred and ninety-six thousand eight hundred ounces more than was produced in the United States last year — which was the largest on record.

The Windom bill only provides for the purchase of silver bullion produced in the United States, and is offered to the government at the current value in the world's markets. The Senate bill *requires* the investment of $4,500,000 per month in silver. This would make the United States a sure purchaser of a fixed amount. Operators would raise and lower the price at their pleasure. Another feature of the Windom bill is the provision authorizing the Secretary of the Treasury to suspend, temporarily, the purchase of silver bullion, at any time when he is satisfied that, through combination or speculative manipulation of the market, the price of silver is arbitrary, nominal or fictitious. As I understand the matter, the House committee on coinage, weights and measures has voted to strike out this most important clause. It is true that such a clause would be giving the Secretary of the Treasury enormous power, and would give him a chance to make a colossal fortune. But a public officer can be controlled more easily than a mob of speculators. From what has already been said and done at Washington, it is very clear that some of the people's representatives are more anxious to prepare the way for their future gain, than they are to do what is best for the country.

This silver question has been having a great deal of attention from European nations; and they are perfectly willing that the United States should lead in the effort to solve the problem. If we must go on building vaults and piling up silver, the Windom bill, while it has serious faults, is by far the best measure now before the public.

It makes but little difference what we use as money, if the leading commercial nations of the world would agree on a standard; and it

will be impossible for any one nation to attempt to regulate the commercial value of silver or any other commodity. There should be an international agreement, so that whatever is used as money in settlements between the people of different nations will have very nearly the same commercial value the world over. Let us hope that the time may come when the value of a coin will be the same in Albany, London, Paris, and all the other commercial centers in the world.

Perfect money must be something which will be received at a fixed value in any of the commercial centers of the world; so that it will not depreciate in value by use, be easily handled and carried about the person, be elastic, so that the volume will expand and contract readily, and that there will be just enough and not too much to meet the needs of an increasing population, the growth of business, and automatically reduce its own volume to the requirements of the dull business season, never requiring the locking up of funds in a commodity or loss of interest at the source of issue. No matter how much or how little currency there is in the country, unless there is some way provided for its expansion and contraction, it will never meet the requirements of the expansion and contraction of trade. During the activity of business, currency must be had to make settlements with and a way must be provided for its absorption when it returns to its source of issue or to the money centers. After the demand for currency for moving the crops has been supplied, people begin to pay their debts, and the money, through the various channels of business settlements, gravitates toward the commercial centers and there collects in the banks. Stockholders are looking for dividends, and every one connected with the management of a bank knows that he must be wide awake in these days and keep the money earning something. Any body who has good collateral to offer, takes the money. Speculation is excited, the money is all in use, and when the season for moving the crops comes around again there is no money on hand.

The people have allowed themselves to feel that the public treasury can supply the financial needs of the people. The government has been in the habit of allowing the idle currency to accumulate in its vaults during the season when it was not needed for use, and then, in the fall, purchasing bonds and paying out the currency for them. But the time is not far off when the bonds will be scarce, the price high, and the plan of having the government purchase bonds to relieve the money market, will not meet the situation.

For some years past the National banks have derived little or no

profit from their circulating notes. The result has been that for about two years past they have been rapidly withdrawing their notes, and the people have relied on the government to make sufficient disbursements for bonds and other purposes to give elasticity to the currency and bridge over the crop-moving period. Few people have a correct idea of the extent the public treasury has been relied on to give elasticity to the circulating medium. If any one wishes to figure this matter out, he can easily do so at any time, by first ascertaining the total coinage for the year, adding to this about one hundred millions disbursed by the government for bonds and other purposes and then deducting the amount of the National bank notes withdrawn from circulation. The result will show to what extent the government has been called upon to do a work which was formerly so well done by the National banks.

For about twenty-five years the National banks have given the people a currency which has never been surpassed, if it has ever been equaled. It has been of uniform value throughout the country, elastic, convertible, convenient, and as safe as any circulating medium that I know of. It has served the people well, and a universal demand should be made that some plan shall be adopted for their continuance. Government bonds are being paid off, it may not be possible to obtain them for use as a basis for circulation, and some different plan must be adopted. There are several plans now before Congress. The people ought to call on their representatives there to mature and adopt the best one. The National banks and the people can exchange notes, and expand and contract the currency whenever it is mutually beneficial to do so.

The prosperity of a country does not depend on the amount of the circulating medium. All that is necessary is to have enough so that every person who has the means for getting it can have enough to make settlements with. Unpractical men talk and newspapers publish articles, which let loose a great deal of nonsense and lead people to suppose that the Silver bill is something in the nature of an inheritance, bounty, pension, annuity, or an endowment annuity. It is of no use for the improvident to think that they will all be given an abundance by legislative enactment. No matter how much silver is bought by the government, I have no idea that any one of us will find his bank account materially increased. What the people need more than the coinage of more silver dollars by the government, is a better knowledge of financial questions, conservative and thrifty habits, and to strive for a good bank account. The average business man is too

much extended. More caution should be the rule. Instead of relying on chance, or the government's going into the open market and purchasing bonds, silver or any other commodities, and taking out of the market that for which there is no other ready purchaser at the same price, thereby putting money in circulation at the commercial centers, every man should attempt to so husband his resources that he will have money enough on hand to meet emergencies. It is of no use for the people to undertake to charge our monentary system with all their misfortunes in business. The best-equipped men know better than any one else, how easy it is for the most carefully-made plans to get beyond their control. The strongest men sometimes fail from causes which no man could foresee or guard against; but it is a lamentable fact that men too often engage in enterprises for which they have not prepared themselves and have not the ability or the financial strength to carry to success. The man who relies on intelligence, prudence, temperance and industry is more sure of success, than the man who expects that his business will be taken care of, even though he is not equal to the work he has undertaken.

We have had under consideration paper currencies, legal-tender notes and the silver question. No one is more conscious than myself that these topics are capable of being presented more forcibly and elaborately than has been done. But if something has been said which shall help to settle or confirm our convictions that it is best to have, as nearly as possible, an even schedule of prices to correspond with the fixed schedule of prices of labor; that irredeemable currencies invariably result in embarrassment; that demagogues who attempt to confuse the public mind and make it believe that a fiat dollar is as good as a commercial dollar, should be shut out from public favor; that it is imperatively necessary that the executive officers of our government be held to a strict account for their disregard of law; that the public faith must be sacredly kept; that irregular practices by public servants are demoralizing; and to make it evident that these are matters of individual responsibility, concerning which every loyal man is accountable and should have clear and well-grounded convictions, then the object of this paper will have been accomplished.

THE INSECTS OF THE PAST YEAR AND PROGRESS IN INSECT STUDIES

By J. A. Lintner, Ph. D.

[Read before the Albany Institute April 15, 1890.]

The paper that I am about to read was read before the New York State Agricultural Society at its annual meeting in January last. Our Secretary has asked me to repeat it to the Institute at this time. I do so somewhat reluctantly, knowing that but few, if any, of you have any special interest in the study of insects or in the story of their habits. I feel, however, that in consideration of the amount of injury that insects inflict upon our principal crops, at times to the extent of materially enhancing the cost of living, that their study is one which directly concerns every member of the community; while the intelligent person should regard it as his duty to inform himself of the progress being made in the department known as economic entomology, which at the present time is contributing so largely to the agricultural interests of our country.

I have the privilege of again recording the exemption of the crops of the State from any widespread serious insect attack, and a mitigation of some of the more formidable ones of preceding years. Injuries to cereal crops have been remarkably few and local. While in several of the other States, as notably in Ohio, Michigan, Indiana and Illinois, the grain aphis, *Siphonophora avenæ* (Fabr.) has been unusually destructive to wheat, oats and other of the grains, and it has also appeared in injurious numbers in portions of New Jersey and Pennsylvania, in not a single instance has injury from it been brought to my knowledge within our own State. Its ravages in the year 1861 may be recalled by some of you, when, "all over the State of New York except its western section, over all New England, through the northeastern portion of Pennsylvania, and in several parts of Canada, every grain field was invaded, and most of the fields literally thronged with it."

The hop-aphis, *Phorodon humuli*, which was the cause, in 1886, of the almost entire destruction of the hop crop of our State, again appeared in the hop yards of Schoharie and Montgomery counties during the months of July and August, in so great number as to occasion much alarm. Recommendation was made of promptly and thoroughly spraying with an insecticidal wash the infested vines, but very fortunately this was not found necessary, for the heavy rains that set in at the time, and continued for weeks thereafter, proved fatal to most of the hop-lice, and arrested the threatened destruction of the crop.

In neglected orchards, in which category fall most of the orchards of our State, fruit insects have abounded to the extent that the fruit gathered and carried to market and sold has in many instances been in a condition that rendered it absolutely unfit for table use — only suitable for feeding to animals who may not claim the privilege of selecting their food. At the same time the intelligent and enterprising fruit-grower has been able to meet and triumph over his insect enemies by means of the spraying devices and insecticidal washes that the recent studies of our economic entomologists have placed in his hands and directed him how to use. The injuries of the apple-worm can now be so easily controlled that worm-eaten apples should henceforth serve as an attestation of the ignorance, thriftlessness or laziness of their grower. The destructive and long-dreaded plum-curculio is being so successfully fought that it will probably soon be brought under similar control.

The apple-tree tent-caterpillar, *Clisiocampa Americana* Harris, whose abundance last year was unparalleled, again appeared in many sections of the State in immense numbers, consuming a large portion of the foliage of orchards, and thereby greatly impairing the value of the fruit in its diminished size, imperfect flavor, and tendency to early decay.

A remarkable multiplication, such as we have only occasionally to note, was that of a species closely allied to the above, viz., the forest tent-caterpillar, *Clisiocampa sylvatica*, which occurred in Washington county in the early part of June. In a large maple grove visited, in the town of Kingsbury, its depredations were seen to an extent never before witnessed by me. In a tract of perhaps ten acres in extent, on the entire north side where the attack had evidently commenced, the trees, although some of them were two feet in diameter of trunk and

seventy feet or more in height, had not a single leaf remaining upon them; the green leaf-stalks and portions of the principal ribs were alone left. The caterpillars, not having at the time attained full growth, would probably continue their defoliation of the remainder of the grove, unless a disease, apparently bacterial in its nature, which was observed to have attacked and killed a large number, the remains of which were hanging from the tree-trunks, should spread and thereby arrest their ravages.

The usual prevalence of the caterpillar of the white-marked tussock-moth, *Orgyia leucostigma* (Sm.-Abb.), whose operations nearly every year greatly impair the beauty of the foliage of the maples and the horse-chestnut, was not observed by me in Albany or its vicinity, or in other sections of the State visited by me, nor was it reported elsewhere, in entomological journals. The conditions of the season may not have been favorable for it; but more probably it had been subjected to serious parasitic attack the preceding year, as it certainly was during the present year, for the conspicuous white egg-masses resting on the cocoons, indicating the development of the female and giving promise of future ravages, were very rarely to be seen this season. The unsightly cotton bands which so many of the citizens of Albany had placed about the trunks of their maples and elms, was labor lost, for so far as my observation extended, they failed to serve their purpose, for the caterpillars were not present about the base of the trees for the purpose of climbing to the foliage.

Two instances have been brought to my notice during the year of an extraordinary multiplication of insects, which has led them to depart from their accustomed habits, and to intrude in large numbers in dwelling-houses, to the serious annoyance and discomfort of the household. One of these was that of the weevil, known as *Otiorhynchus ovatus* (Linn.), which now for the second year has invaded many houses in Potsdam, St. Lawrence county, to such an extent that aid has been asked in the effort to meet the invasion. The beetle had previously in other localities in the State displayed a propensity for entering dwellings, as was noticed in my second report (under the name that it formerly bore of *O. ligneus*) but never before in such remarkable numbers as reported from Potsdam. It was more abundant on the exterior of houses, where, at times, the railings of piazzas would be black with their bodies, as they climbed up the side walls to the roof above, and could be collected from the gutters, as stated, by quarts.

The other instance is that of a very small beetle, *Silvanus Surinamensis* (Linn.), commonly known as the grain weevil, and oft-times exceedingly annoying in granaries and mills. A house in Catskill had been invaded by millions of them in the month of September, where they took possession of beds and bedding and infested all farinaceous food. It was believed to have originated in some sweet corn stored in a barn not far distant from the house and, in its multiplication, to have entered the house in search of food. The most efficient materials for the destruction of the insect were found to be kerosene and pyrethrum powder.

In my second report several pages were devoted to observations on the chinch-bug, *Blissus leucopterus* (Say), in Jefferson county, in the year 1883, where so large an acreage of grass and clover was destroyed by it as to occasion great alarm, and excite the fear that it was destined to become one of the permanent pests of our State, as it for a long time has been of several of the Western States. Professor Forbes, State entomologist of Illinois, has written of it: "It is the most dangerous insect foe with which we have to deal. That it taxes them more heavily than all other such enemies combined, is burnt into the convictions of thousands of farmers by repeated heavy losses and bitter disappointment."

The following year, 1884, as the result of the thorough plowing, burning and other active measures with which it was met, and no doubt, also, to seasonable conditions unfavorable to it, it did not reappear in Northern New York in injurious number. Since that time I have had no knowledge of further injuries from it, until quite recently, a correspondent, Mr. Van Duzee, of Buffalo, who is making special study of the order of Hemiptera, to which the chinch-bug belongs, has written me of serious losses resulting from its presence in Erie county, particularly in the central portion of the county, near Lancaster. He reports a field of three acres of timothy grass at Lancaster which in 1888 yielded as fine a crop as was ever seen, the past year not worth the cutting, as the result of the operations of the bug. Fortunately the attack was arrested and kept from spreading, as it gave every indication of doing, by the cold heavy rains that commenced on the 18th of May and continued for nearly a month, followed by the notable sharp frost on the 29th of May. Many of the farmers had complained to him of serious injuries to their hay crops in 1888 and 1889, "from the bug."

The grapevine flea-beetle, *Haltica chalybea* (Ill.), is apparently on the increase in Western New York, and is becoming a pest of the grape-growers, if we may judge from the frequent inquiries received of its habits and how to deal with it. Its multiplication should not be permitted, but should be persistently fought by breaking up or removing in the autumn its usual places of hibernation, as loose bark and the refuse material of the vineyard, and by preventing the beetle eating out the heart of the buds in early spring. It is claimed that this form of injury can be prevented by spraying, in March, with a mixture of lime-wash made with brine, to which is added some London purple. The grapevine leaf-hoppers are also occasioning a great amount of harm. I purpose as soon as may be to give them special study.

A new insect pest has been exciting much interest in adjoining States—in New Jersey and Pennsylvania—during the past year. As yet it has not to my knowledge appeared in the State of New York,* but as it will in all probability soon extend its range hither as it is rapidly spreading northward, a few words in relation to it may serve to give early knowledge of its presence, and thereby enable farmers to meet it promptly and check its increase.

The larger number of our most harmful insect pests have been brought to us from Europe, and this is one of the latest additions to the extended list of much to be regretted importations that might be given. It is native to the south of France. It was first noticed in Pennsylvania in 1886, and from its habit of collecting in masses on the horns of cattle so as completely to cover and blacken them toward their base, it has been given the common name of the "cow-horn fly." Other names that have been applied to it, are "cow-fly," "horn-fly," "Texan-fly" and "Buffalo-fly." Scientifically it is *Hæmatobia serrata* R. Desv. It is a small insect, not so large as the common house-fly but resembling it in general appearance, and is quite closely allied to the common biting fly, *Stomoxys calcitrans*, which often greatly annoys cattle and horses by inflicting its sharp bite, usually upon their legs. Unlike that, however, this confines its attack to cattle, not extending it to horses, mules or man. Greatly exaggerated statements were at first made of the injury wrought by the fly. Common report represented it as depositing eggs at the base of the horn, the larvæ hatching from which burrowed into the head, entering the

[* At the present time, 1892, it is quite generally distributed throughout the State.]

brain, and often causing the death of the animal within twenty-four hours.

As soon as scientific study could be given the insect, it was found that the harm resulting from the presence of the fly was not so serious as to be the occasion of alarm. No deaths had resulted from it, and the cows were not dehorned by it. In the thinner-skinned and more sensitive animals, as the Jerseys, the bites and bloodsucking and resulting inflammation might, perhaps, through rubbing, produce sore and bleeding spots. The amount of harm caused by the fly seems to be narrowing down to a falling off in the amount of milk and cream of infested herds, reported by some at one-third, and in one instance, in New Jersey, at one-half of the usual production.

The life-history of the fly has been studied out, and published, by the division of entomology at Washington,* and by Prof. J. B. Smith, of the State Agricultural College of New Jersey. Its eggs are deposited in the fresh droppings of the cattle. The larvæ, feeding and maturing therein, may be destroyed by a daily sprinkling of the droppings with lime, or better still, as not liberating the ammonia, with plaster. Protection from the bite may be had by the application of oils to the body of the animals.

[For a more extended notice of this insect, see *Fifth Report on the Insects of New York*, 1889, pp. 78–85; pp. 220–227 of 42d St. Mus. Rept.]

Another introduced insect pest, long known in Europe for its injuries to wheat and rye, has been brought to notice the past year. It bears abroad the common name of the "corn saw-fly," but this may not be used by us as it would be misleading, since with us "corn" is applied only to the *maize* or Indian corn, while in England it is used collectively for all of the cereals or farinaceous food-plants which grow in ears, viz., wheat, rye, barley, oats and maize. Its scientific name is *Cephus pygmeus* (Linn.).

It was discovered two years ago (in 1887) infesting wheat on the Cornell University farm, at Ithaca, where it has already become extremely abundant, but strangely, has not been observed, so far as known, elsewhere. Professor Comstock has made it the subject of a Special Bulletin — No. XI, November, 1889 — in which a full account of the insect is given. The larva, hatching from the egg deposited in a slit made by the ovipositor of the female fly, usually in the upper portion of the stalk, four to five days before its heading out, burrows

**Insect Life*, ii, 1889, pp. 93–103, figs. 11–15; *Report U. S. Dept. Agriculture* for 1889, p. 346.

within, working its way both upward and downward while feeding on the inner portion, and passing successively through all of the joints. Indications of its presence seldom appear before the first week in July, when it has penetrated to the first joint above the ground, at which time a discoloration beneath it may be noticed. When much of the inner portion of the straw has been eaten away, the stalk is liable to be broken and thrown to the ground by high winds that may prevail.

At the time of the harvest, nearly all of the larvæ have burrowed downward to the surface of the ground, where a cell is excavated and closed at the top with borings, and a cocoon is spun of fine silk. Here, after the cutting of the grain, it remains within the stubble, hibernating in its larval stage, and not assuming its pupal form until the following spring — in March or April. Some time in May the winged insect emerges from the pupa, and appears abroad upon the wing.

Professor Comstock reports that somewhat under five per cent of the wheat straws have been found to contain the insect. He does not find its injury to be so great as reported by European writers. Careful weighing of the kernels of infested and uninfested heads, shows but a very moderate amount of difference in weight. Perhaps the rye crop might be more seriously affected by it. It is an insect that comes to us with a bad reputation, and, therefore, effort should be made to arrest its spread. The Cornell University Station would accomplish a good work if they would not permit us to hear of its operations beyond their own borders. The wheat stubble of their farm may, at the present time, entirely monopolize the living and unfledged material in this country.* It is thought that it may have been brought over from England in straw used for packing.

It is of no little interest to the naturalist, when the date and locality of introduction from abroad of a species of injurious insect can be definitely ascertained, that its rate and lines of distribution may be more accurately determined, and change of habits under its new environments observed. The last half century, prior to which but little attention had been given to the study of insects in this country, affords approximate data of the kind, for several of our notable insect pests. Thus, to cite a few of these: The elm-leaf beetle, *Galeruca*

[*Publication has since been made of the capture of a single example of the species, at Ottawa, Canada, in 1887, by Mr. Harrington, and of three examples by Mr. Van Duzee, at Buffalo, on the 9th and 11th of June, 1889, showing that it has already attained a somewhat extended distribution. — (*Canadian Entomologist* for February, 1890, xxii, p. 40.)]

xanthomelæna (Schr.) was first noticed in 1838, on elms in Baltimore and its vicinity; the grain aphis, *Siphonophora avenæ* (Fabr.), probably about 1850, but not injurious until 1861; the cabbage butterfly, *Pieris rapæ* (Linn.), observed in 1858, at Quebec, Canada; the asparagus beetle, *Crioceris asparagi* (Linn.), introduced probably in 1856 or 1857, and first seen at Astoria, Long Island, in 1859; the hop-vine aphis, *Phorodon humuli* (Schrank), recorded for the first in 1862; the currant worm, *Nematus ribesii* (Scop.) (formerly known as *N. ventricosus* Klug), introduced about 1860, it is believed at Rochester, N. Y.; the carpet beetle, *Anthrenus scrophulariæ* (Linn.), about 1870, in New York city and in California; the clover-root borer, *Hylesinus trifolii* (Müll.) (lately referred to *Hylastinus obscurus* Marsh), about 1875, first observed in Yates county, N. Y., in 1878; the pear midge, *Diplosis pyrivora* Riley, in 1877 or 1878, at Meriden, Conn.; the larch saw-fly, *Nematus Erichsonii* (Hartig), first seen in 1880, on imported larches, at Brookline, Mass. To the above formidable list, a score of others, introduced within the period embraced, might be added, the injurious character of several of which would entitle them to special mention. I will only add to the list, at this time, by mention of, and brief reference to, one which has been brought to our notice during the past year, and which is exciting so much interest in Massachusetts that the governor of the State has deemed it proper, in his late message, to call public attention to it, that, if possible, it may not be permitted to extend over the State, and other States of the Union. The insect is the *Ocneria dispar* of Linnæus, popularly known in its winged stage as the Gypsy moth. It is an old pest of European countries, more particularly perhaps in Germany than elsewhere, where at times its caterpillar has stripped the foliage from entire forests. It is one of the kind known as polyphagous or having a great number of food-plants. Hardly any shrub or tree, whether fruit or forest or ornamental, is rejected, and garden vegetables and other products are also eaten by it. It is evidently adapted to a very broad distribution, occurring, as it does, throughout Europe, Northern and Western Asia, and in Japan.

It was accidentally introduced in the United States in the year 1869, by an entomologist, Mr. L. Trouvelot, then living near Glenwood, Medford, Mass., who was engaged in experiments with the production of cocoons suitable for silk manufacture, from our native silk worms and a few foreign species. From some cocoons of the Gypsy moth, brought over by him, the winged insects emerged, and a few chanced to escape. Their progeny, adapting themselves to the

conditions presented, have continued to increase from that time onward, until they have become thoroughly naturalized. Fortunately, the species is single-brooded; the female does not deposit many eggs, and its heavy abdomen disinclines it to extended flight. Hence it is, that although twenty years have passed since its colonization, the area of distribution which it has appropriated and now holds, is limited to an ellipse of about a mile and a half by a half-mile in extent, in Medford, a few miles northwardly of Boston. But within this area, it appears, from the report of Professor C. H. Fernald, entomologist of the Massachusetts Agricultural College and of the Hatch Experiment Station, to have displayed a remarkable voracity. In the special bulletin of the station for November, 1889, devoted to the insect, it is said to have "multiplied to such an extent as to cause the entire destruction of the fruit crop and also to defoliate the shade trees in the infested region" — that above named. That an insect capable of such destructiveness, and with such an European history attached to it, should be promptly met and exterminated while practicable in its present limited area of occupation, will be conceded by all. It is reported by the press that an appropriation from the State Legislature has been asked for the purpose. Professor Fernald expresses his confident belief that "if every tree and shrub in the infested region in Medford be thoroughly showered with Paris green in water, soon after the hatching of the eggs in the spring, the young caterpillars will surely be destroyed; and if any escape, it will be because of some neglect or ignorance in the use of the insecticide." He is not positive that the insects "can be exterminated in a single year, but entertains no doubt but that, if the work of showering be continued during the months of April and May for two or three years, under competent direction, they may be entirely destroyed."*

Passing now to another division of my paper, may I speak briefly of the progress being made in insect studies, particularly as they relate to the control of insect depredations?

After having been laboring for many years in a field of study in which the forms requiring investigation are far more numerous than all the other classes of the animal kingdom combined — with but few, perhaps ten or twelve co-laborers throughout the United States, and with results not always meeting the demand

* An appropriation of $25,000 has since been made by the Massachusetts Legislature for the extermination of the moth, and three commissioners have been appointed by the governor who have already (in March) entered upon their work. Since the above was written the insect has spread over a considerably larger territory.]

from our agriculturists for aid in times of need — it affords me more gratification than I can express, to be able to report a progress in economic entomology, such as I had not dared to hope ever to see. Those of you who have had hard experiences in your gardens and elsewhere in fighting some of our most common insect pests, such as the wire-worm, the white-grub, the rose-bug, the cucumber-beetle and the cabbage-worm, should also rejoice with me that these, together with many others of the kind, will, in all probability, ere long, be brought under such control that serious injury from them can be prevented. Scores of enthusiastic workers are now engaged in earnest study of the successive stages in the lives of our more injurious insects, that their most vulnerable points may be learned, and in experiments which shall indicate the most simple, inexpensive and efficient method of dealing with each insect pest. No preceding year has marked so great an advance in applied entomology as has the last.

This is the direct result of the beneficent provisions of what is commonly known as the "Hatch Act" of the forty-ninth Congress, of 1887, for the establishment of an agricultural experiment station in each of the United States, to embrace those departments of investigation and experiment which will bear most directly on the agricultural industry of the respective States. Thirty of these stations have already organized a department of entomology, or of entomology and botany united — the two studies being intimately connected in the interrelation of insect injuries and plant diseases. The valuable work accomplished by these entomologists has been shown in several publications, in bulletins of the stations, etc., which have been highly creditable, and, undeniably, contributions of much economic importance; and further, giving assurance of rich results to follow.

I cannot refrain from referring, in illustration of the character and value of the work that is being done in insect warfare, by the experiment stations, to that recently conducted at the Minnesota Experiment Station, by its very able entomologist, Dr. Otto Lugger. It was an effort to save from destruction the crops of a section in Otter Tail county from the descendants of a few Rocky Mountain locusts, *Caloptenus spretus*, that had located there in 1884, and at the time that active operations against them were commenced (in 1888) had hatched in numbers sufficient, as estimated, not only to destroy the entire crops of that county but of a large portion of the State. The preceding year five thousand acres of wheat had been swept away. In this

emergency appeal was made to the governor of the State for aid. Dr. Lugger was commissioned by him to visit the locality and report upon the situation. Upon his report the governor at once sent to the infested region the material that was asked for in sheet-iron for making large pans to contain tar and kerosene, and muslin for the construction of bags, in which to catch and kill the "hoppers." By means of these, fifty and more bushels of locusts (nearly all young and requiring, at the least, seven thousand individuals to make a bushel) were caught and killed daily near Perham during a week in June. By the 1st of July, from a low estimate, twenty-five hundred bushels had been killed. The labor required was paid for by the county commissioners, with the promise of being returned by the State, which was thereafter done. Later, it was determined to pay a bounty for catching and killing the hoppers, and one dollar a bushel was offered by the county commissioners. As the "hopper-dozers" — the popular name for the ten-feet long sheet-iron pans which had proved so efficient — did not hold the insects that were swept into them, but allowed perhaps four-fifths of the number to jump from the oil to die thereafter on the ground, another device was resorted to. This was known as the "balloon hopper-catcher," and consisted of a frame of strips of wood, eighteen feet long, to lie flat on the ground, and carrying upon it a large, loose bag of cheese-cloth, with a spout made of a sack sewed into one corner. As this is drawn quickly over the ground by a horse, and the bag or balloon becomes inflated by the wind or draught, the "hoppers" are scooped up, or hop or fly into it. When the bag is filled, the insects are removed to other bags, in which they are tied up for convenient measurement. It worked admirably, and yielded golden returns. The fields were covered with hopper-catchers — men, women and children — the latter using their aprons and shawls, and the women, table-cloths and sheets. The farmers gave up their usual work for this better remuneration. They would allow no one to share with them in the ingathering of this harvest, all intruders being warned away by such signs as these posted up in conspicuous places: "All hopper-catching forbidden on these premises," or "For the privilege of hopper-catching apply to ——— ———." The crop was undoubtedly the best paying one that their lands had ever yielded. The number of bushels caught and measured in this manner, and paid for by the commissioners, was fourteen thousand three hundred and fifty-seven. The nearly $15,000 required for the purpose was considered as money well expended. At the lowest estimate, the number of bushels of locusts killed in Otter Tail county,

during the season, was thirty-five thousand. The total expenditures, under the different methods employed, was $17,757; and, as the result, the crops of most of the farms were saved.

It having been found last spring (1889) that the eggs of the locusts had been mainly deposited in stubble-fields, and that in every case where such lands had been plowed, as the result of the deep burial of the eggs beneath the surface, hardly a locust had made its appearance, it was determined to plow all of the more badly infested fields, through the aid extended by the State, while continuing the use of the "hopper-dozers" on the less infested portions. All such fields as were found on examination to contain a large number of the eggs, if exceeding twenty-five acres (the smaller plots being left to the owners to plow), were condemned, and farmers living in the vicinity were invited to plow them within a given time. The plowing was to be properly done as supervised by the owner, to the depth of at least five inches, for which the laborer was entitled to draw his pay of $1.25 per acre. This measure proved to be a complete success. No locusts hatched in the plowed fields. Where the young had emerged from the eggs, they were buried in the furrows and killed. The number of acres plowed as above, was six thousand three hundred and sixty-one — a trifle less than ten square miles. The entire expenditure for the season, including the "hopper-dozer" catching, burning over stubble and dead grass fields, poisoning with London purple, etc., was $10,131.

As the result of the operations above narrated, the insect has been virtually destroyed throughout the infested districts. Comparatively few eggs were laid last year, and there is no apprehension of serious injury from the few survivors the coming season.

When you recall the fearful losses from this Rocky Mountain locust in some of the Western States in former years that brought poverty and starvation to thousands of their people — estimated at two hundred millions of dollars in a single year (1874), in the four States of Missouri, Kansas, Nebraska and Iowa—you can not but regard it as a triumph for economic entomology, that this great scourge, almost equaling in destructiveness, in years of its abundance, the migratory locust of the old world, has been brought under control.

I have on many former occasions felt it my duty and privilege to mention and commend the work being done by the Entomological Division of the Department of Agriculture at Washington. It well deserves the liberal support extended to it by our general government, and the appreciation and encouragement which it is receiving

from the present Secretary and Assistant Secretary of the Department. Its studies are thorough and of great practical value. Its publications are characterized by a merit that makes them eagerly sought for by entomologists throughout the world. Its collections — remarkably rich in biological material — its manuscript and other unworked matter relating to insect lives and habits, surprised me with their amount and richness when a short time ago I was able to look over a small portion of the accumulated store.

The division has recently achieved a signal triumph, to which there is but time merely to refer, interesting as the recital of its story at some length would be.

In 1868, a scale-insect, *Icerya Purchasi*, or, as it is popularly known from its peculiar appearance, "the cottony-cushion scale," chanced to be brought into California, on an acacia from Australia. It multiplied, spread rapidly, attacked almost every kind of vegetation, but was especially destructive to orange trees. Its increase could not be prevented by any means resorted to, although aided by all the scientific skill that could be commanded. The orange trees were killed; entire orchards were taken up and devoted to other uses. The orange culture — so important an industry of the State — was apparently doomed.

It occurred to Dr. Riley, chief of the entomological division, that the ravages of the insect could be stayed, if the natural parasites that had kept it from being a pest in its home in Australia, could be secured, brought to California, propagated in sufficient number, and then turned loose to seek their prey. After much labor and many disappointments, a small appropriation was obtained sufficing to defray the traveling expenses of two agents of the division. They were dispatched to Australia, where they were successful in procuring some of the parasites and predaceous enemies of the Icerya, and in sending them alive to this country. They were carefully cared for, propagated in confinement in large number, and then distributed throughout the infested districts. One of the imported species, belonging to the family of "lady-bugs" (*Coccinellidæ*) has displayed wonderful powers of multiplication, and remarkable fitness for the work assigned it. From the five hundred and fourteen individuals imported last winter, in five different sendings, the present progeny may be numbered by the million.

The success of this measure has far exceeded the most sanguine expectations. It has been simply marvelous! The orange grower now points to orchards which were on the verge of ruin, where it is

not easy to find a single living scale. The, perhaps, most pernicious scale-insect ever known to science, has been conquered, and seems doomed to a speedy extermination. The California fruit-growers are jubilant over the success of the first experiment of fighting an introduced pest by the importation of its natural enemies — often proposed but never before accomplished.

Considerable attention has been given by Professor Forbes and others to the contagious diseases of insects, to which some of our insect enemies have shown themselves to be quite liable. They have at times assumed an epidemic character, and have thereby proved highly beneficial in arresting serious and widespread ravages. It has been hoped that much might be accomplished by the distribution of insects infested with contagious disease to uninfested localities, and thus rapidly and greatly extend its sphere of operations. Experiments of this nature have been made the past year in Minnesota and in Kansas to utilize a fungus disease with which the chinch-bug has been recently attacked in some of the Western States. In Kansas, numbers of the diseased bugs were collected which, being confined with apparently healthy ones, readily communicated their malady to them. When a sufficient quantity were obtained in this manner, distribution was made of them at various points along the railroads of the State and other principal lines of travel. It is claimed that in almost every one of these localities the disease subsequently made its appearance, and it is believed that it was conveyed and quite largely extended through this distribution.

Lest I should weary you with details that may not be of general interest, I will not extend them, trusting that what I have already presented will suffice to show that economic entomology is not only a live science, but that it has attained a vigorous manhood, in which it is prepared to do its full share in the extension and promotion of the first and foremost of the great industries of our country — the agricultural.

THE GLOBE OF 1513, AND THE PROGRESS OF GEOGRAPHICAL DISCOVERY AND MAP-MAKING FROM THE TIME OF COLUMBUS TO 1600.

By GEORGE ROGERS HOWELL.

[Read before the Albany Institute December 16, 1890.]

When I proposed to prepare this paper for the Institute I had in mind simply the description of the globe which a few months ago came into the possession of the Bibliothèque Nationale at Paris, after having been lost to the world for generations in a private library. But the discussion involved so much study of the whole subject of early discovery and map-making of the American continent that I decided that it would be more interesting to men busy all in their several and varied lines of study, if I sketched the gradual growth of the knowledge of geography. In approaching this subject, therefore, let us forget for awhile, if we can, modern geography, and put ourselves back to the knowledge of the earth's surface as it existed in the time of Columbus in the year 1492. Fortunately for us, in that very year a German geographer, and the most distinguished of his time, Martin Behaim by name, constructed a globe twenty-one inches in diameter, in the city of Nuremberg, where it has remained to this day. An inspection of this globe shows that the map-makers of that day had a very incorrect estimate of the magnitude of the earth. Thus, the meridian of longitude on the eastern limit of the hemisphere that includes the Atlantic ocean, passes through the western part of Spain and Africa. The meridian on the western limit of this same hemisphere passes through Asia, leaving a considerable portion of it in the map. Now this eastern meridian on our modern globes, as it passes over the north pole and is carried on to the antipodes, really passes through the middle of the Pacific ocean between North America and Asia. We see here at once that the globe of Behaim places Asia where North America really belongs. America and the Pacific are blotted out entirely. On the other hand, both then and for at least forty years from this date, Asia was spread out enormously east and west to fill up the degrees of the globe. The several groups of the Azores, the Canary, the Madeira and Cape Verde Islands are all given, not far from their real location.

Japan under the name of Cipango, is found off the coast of India, far to the south of its true location. Two other famous islands are found here, Antilia and San Brandan, which after the fourteenth century were supposed to exist in the most western parts of the ocean. Of Antilia Behaim says: "In the year 734, after the conquest of Spain by the Mohamedans, this island, Antilia, was discovered and settled by an archbishop from Oporto in Portugal, who fled to it in ships with six other bishops and other Christian men and women. They built there seven towns from which circumstance it has also been called the island of the seven cities. In the year 1414 a Spanish vessel came very near to it." This island of the seven cities, like the fountain of ever blooming youth, figured in all the dreams of discoveries for centuries. It is somewhat singular that Cortereal, after he had discovered the island of Newfoundland, announced that he had found the island of the seven cities. I may add here that the name in its Spanish form, Antilles, was very naturally transferred to those islands near Cuba upon their discovery.

Regarding the other island, San Brandan, Behaim says: "In the year 565 Saint Brandan, an Irish bishop, arrived with his vessels on this island, saw there most wonderful things and returned afterward to his country." These islands are found on the maps of the fourteenth and fifteenth centuries, and many expeditions were sent out for their discovery even in the seventeenth century.

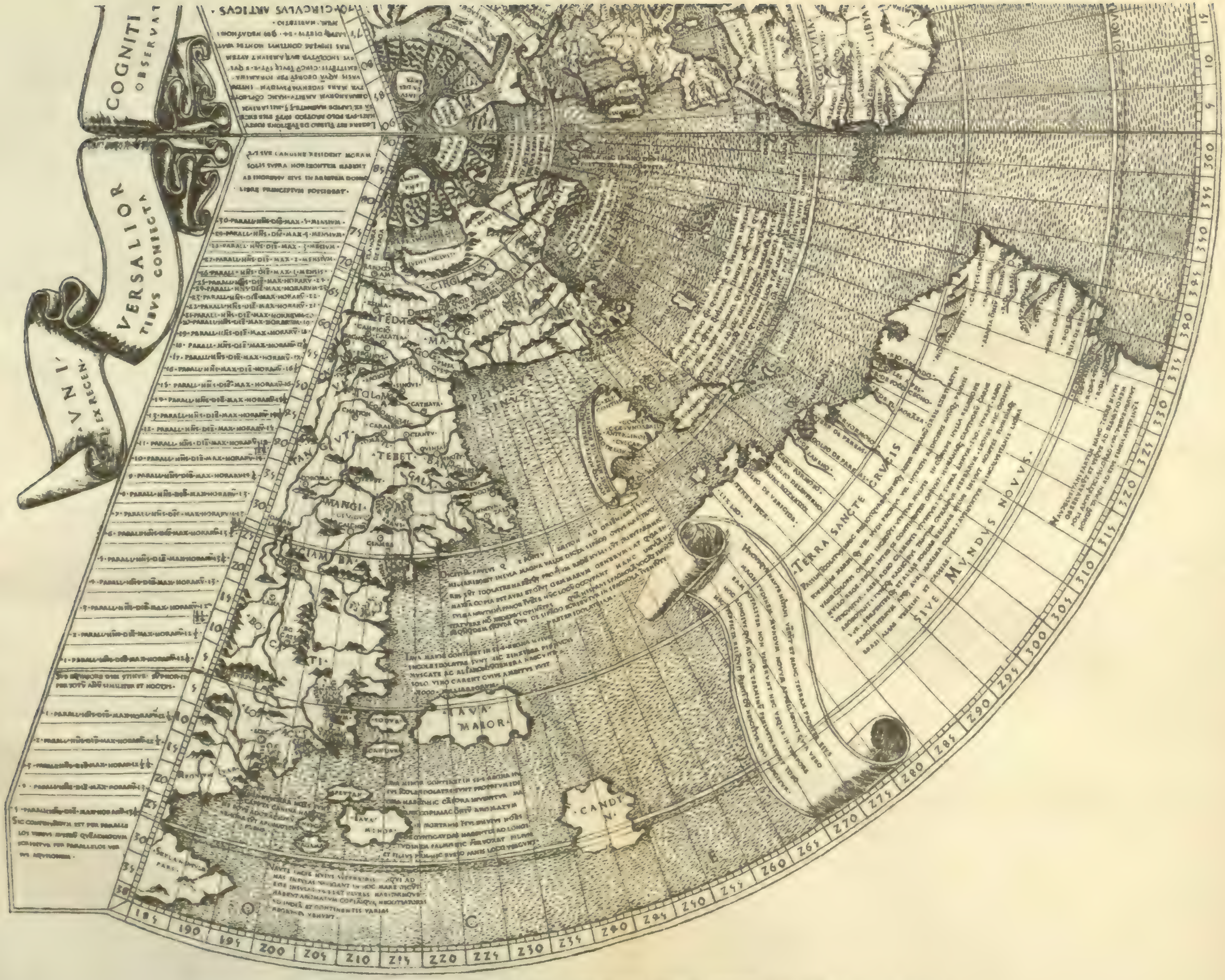
In the eastern portion of Asia given on the map, *Mangi* is the name of a Chinese province mentioned by Marco Polo. *Cathaia* is the old name of northern China. As for the rest of the globe, not reproduced on the map, a tolerably accurate outline of Europe, Asia and Africa is given, although Europe is dwarfed, and Asia and Africa broadened out east and west beyond their real proportions. It was just such a map as this, one made in 1474 by Toscanelli, an Italian, that Columbus had with him on his first voyage of discovery. So far, theory, speculation and maps. Now comes the time for action. And what impelled the Genoese to venture out on untried seas, to exert himself to convince skeptics, skeptics who alone could furnish him ships and provisions, to stand up alone against reluctant and mutinous crews and subdue them as they sailed on and on over the waste of waters? As usual many and mixed motives, personal ambition to find new lands, to be a discoverer, the true scientist's keen desire to add to the fund of human knowledge, but back of all an impelling power that rules the world, money. It was for money that represents food, shelter, clothing and all that ministers to comfort or luxury. Money as made

by trade and commerce, and crude ore from the mine. Europe wanted the silks and gold and spices of the east. All these came slowly with toilsome travel, by caravan, and in small quantities from India and China and the neighboring islands. The Portuguese were on the same quest. They had discovered the Azores in 1431 and Cape Verde Islands in 1472. The ships of Prince Henry and of Alfonso and John, his successors, went creeping down the west coast of Africa, each succeeding voyage penetrating a little farther, until at last in 1484 Diaz came to the Cape of Good Hope, and in 1487 went beyond it into the Indian ocean and announced his new route to the riches of the east. The camel of the desert was now to give way to the ship on the ocean. But Columbus now conceived a shorter cut; sail west until you find the east; and if the ocean is no wider than Behaim and all the famous geographers declare then that is the shortest route to India and Cathay. It is not the only time that science has been indebted to vulgar trade for its most valuable discoveries. Nor science only. Art and literature as well have furnished the world some of their best productions under the spur of necessity. When, therefore, after a voyage of somewhat over two months, he began to thread the channel of the Antilles, he thought he was in the archipelago of islands east of the Ganges. And when a little later he discovered the large island of Santo Domingo he believed it to be Japan, or Zipangu, as Japan was then called. This theory satisfied him until Cuba was sighted and then *this* island was identified as the Zipangu of Marco Polo. To Santo Domingo he gave the name of Espagnola, and to Cuba that of Isabella. Cuba retained the honors of Zipangu in the mind of Columbus until his confidence in that theory was shaken by the great length of the southern and southwestern coast. Now he thinks it too large for an island and that it must be the main coast of Cathay and Tartary. Accordingly he sends two ambassadors inland to present his respects to the Grand Khan, and these return in a few days with graphic reports of their adventures. In his second voyage on the south coast of Cuba, he still believes he is on the Gulf of Ganges and so writes to Peter Martyr and even has the crew subscribe to a declaration under oath that they were on the coast of the country of the Grand Khan. And then he transfers the name of Zipangu back to Espagnola and gives the name of Juana to Cuba. In his third voyage in 1498 he obtains his first view of the American continent, on the coast of Venezuela, discovered the year before by Vespucius, and goes north along the peninsula of Darien and supposes it to be the coast of China. He goes down to his grave in 1506, to the last unconscious of the magnitude and mean-

ing of his discoveries. In spite of all subsequent discoveries, to Columbus the world deservedly awards the highest honor. The New World was discovered when from the Greek traditions, and from the legendary lore of the sailormen of his own day, and from books and maps at home he made up his mind that there was a New World to discover. All the rest was mechanical and could have been accomplished by a common sailor. His adventurous spirit had thrown open the doors to a new continent, and others rushed in to reap the honors. Amerigo Vespucius, for one, who with Ojeda in 1497, under the Spanish flag, was the first to discover the continent of South America; John Cabot, for another, who in the same year sent out in the interest of England under Henry the VIIth, was the first to discover the continent of North America at Labrador and Newfoundland, followed in the next year by his son Sebastian Cabot, who sailed along the coast from Newfoundland southward, and, as some claim, as far as Cape Hatteras, and thus laid foundation for England's claim to the northern portion of the continent. Like all the others of his day, he announced on his return that he had discovered the eastern coast of Asia. This general belief of that period is perhaps the reason why the several nations of Spain, Portugal, France and England let their claims by right of discovery slumber. A curious thing happened. The mapmakers to some extent ignored the claims of other nations to discovery. Thus, on the Ribero map of 1529, we notice along the coast of the United States, the names, "the land of Ayllon," "the land of Gomez," "Francesca," "Cortereal," applied to territory discovered by the Cabots in the interest of England.

Upon the return of Columbus from his first voyage in 1493. Pope Alexander VI divided the world into two parts by a meridian line passing around it three hundred and seventy leagues west of the Cape Verde islands. This gave to Portugal all her African discoveries and Brazil in South America. All west of this line was awarded to Spain. Thence came the designation of West Indies to the American continent, subsequently restricted to the Antilles islands.

Now let us resume the narrative of discovery. Vespucius, as I have said, first discovered the mainland on the western hemisphere in 1497. In a second voyage he coasted along the isthmus and up to Florida seeking for a return passage homeward by still sailing westward around the globe. Down to Henry Hudson in 1630 the ships of Europe patrolled our coast from the northern limits of Labrador to the Straits of Magellan for a water passage westward to Cathay. That idea died hard. That problem was not solved until our day, in the sixties, when



Part of the UNIVERSALIOR COGNITI ORBIS TABULA by John Ruysch of 1508.

two ships met in the Arctic ocean, one of which had entered by Behring's and another by Davis' straits. In 1504 Vespucius published an account of his discovery of a new continent in the south, calling it the New World or the Land of the Holy Cross. By the way, there was an island by the name of Brasil located on the pre-Columbian maps in the neighborhood of Antilia, in the western part of the ocean. The word Brasil itself is the name of a kind of wood and is of American origin. Soon after the discovery of the continent by Vespucius this name was transferred to the mainland. In 1507 Waldseemüller, a German scholar at St. Dié in Lorraine, bestowed upon it the name of America in honor of its discoverer, in a book published by him. The first book-map to contain the name of America was in a work entitled "An Introduction to Cosmography," printed between 1514 and 1520. The first globe to adopt this name was that now in the Bibliothèque Nationale in Paris, of 1513 or 1518, the last figure being indistinct, but the geographical ideas shown by the globe are those of 1513. This globe would seem to settle the question forever as to the origin of the name of America, the globe having been made so near the time of its adoption. It contains the legend under the name of America, "So named from the discoverer." The globe of Schöner of 1515 also has the **name America, as we shall see later.**

I now call your attention to the history of Cuba on the maps. The last mention of it left it in the estimation of Columbus as the mainland of Asia. It was in 1508 that Ocampo found it to be an island. In 1508, on Ruysch's map, the western coast of Cuba is terminated with a scroll, the conventional manner of the old cartographers of marking unexplored lands with unknown limits. The apparent peninsula to the west of Cuba is called Zaiton and is said by Ruysch to be generally believed to be Zipangu. The peninsula on Ruysch's map to the north of Cuba represents Newfoundland, rediscovered in 1500 by Gaspar Cortereal, a Portuguese, and from him on the Portuguese and Spanish maps for many years called *Terra* or *Insula Cortereälis*, or the land or island of Cortereal. Sometimes we find attached to it the name of Baccaleos, but generally this name is given to Labrador or, still more frequently, to a district of country between Labrador and Newfoundland. Baccaleos is etymologically the land of codfish, that is, the land whose coast abounds with these fish, as Labrador is the land of the laborer, or peasant, or man of low condition. Sometimes, as in the Schöner globes, you find Cortereal or Newfoundland quite distant from the mainland. As we advance a few years we notice change, if not always progress towards the truth. In 1513 Nunez de Balboa, from

the mountains of the Isthmus of Panama, was the first to discover the Pacific ocean, which was for many years called the South sea, because it was supposed to reach only to the equator northwards and Asia to be continued eastward to the land of Cortereal.

Let us now look at the map in the Ptolemy of 1513 and Schöner's globe of the same year. "A strange confusion now began to seize the German geographers of Strasburg and Vienna. They made Cuba an island and called it Isabella, and then transferred all the names from Isabella to a mainland named usually Terra de Cuba, connecting it with Paria (sometimes with and sometimes without a narrow strait), standing bolt upright, and extending to forty-eight degrees north latitude, with a point like Florida and a gulf to the west of it. This was still supposed to be Asia, the Florida-like projection being the Corea, and the gulf, the Gulf of Ganges, and the three-mouthed river the Ganges." On the globe of Schöner it is separated from Zipangu by five or six degrees of Balboa's newly-discovered South sea, which is by an unusual guess for that period carried up to the north pole.

Looking on Schöner's globe of 1513 we find the inevitable coast of Asia within twenty degrees of Zipangu and that island is only five degrees to the west of Cuba. South America is much narrowed at the center and a mythical continent with the name of Brasil curls about to the south like a modern gerrymander.

Passing on for seven years we find no great changes in the Schöner globe of 1520. North of the equator it is practically the same. At the south, South America is designated as America, or Brasil, or the land of parrots. The lower continent is increased north and south and is called Lower Brasil.

In 1531 a globe of Orontius Fine shows some very curious views of geography. South America, the West India islands and the peninsula of Florida are given with a fair degree of accuracy, but there accuracy ends. The isthmus of Central America broadens out to a width of twenty degrees under the name of Parias and is a continuation of East India with China to the north, from the coast of which sweeps around a large gulf to the western shores of Florida. The eastern coast of Florida runs nearly straight north for fourteen hundred miles, then turns abruptly to the east on the latitude of sixty degrees for thirty-six hundred miles. This vast land is called Baccaleos and is a continuation of Asia.

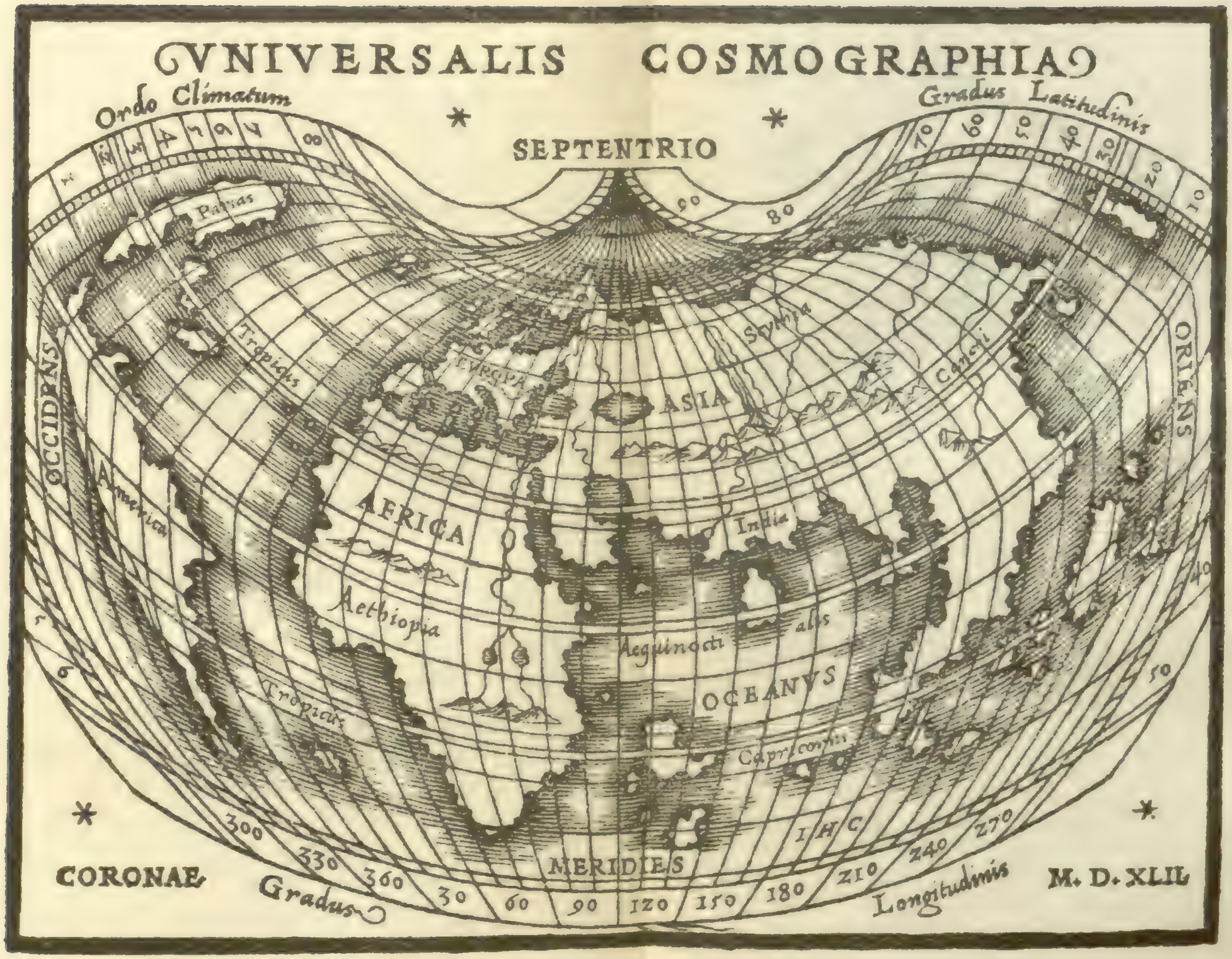
Fifteen hundred and thirty-two, forty years from the discovery of Columbus. Look now at the map of Munster given in the Novus

TABVLA TER RE NOVE

OCEANUS OCCIDENTALIS seu TERRAE NOVAE: Reduced from the Ptolemy of 1513

OUTLINE OF THE WESTERN HALF OF SCHÖNER'S FIRST GLOBE, CIRCA 1515.

Reproduced from Dr. Wieser's "Magalhães-Strasse", 1881.



Honter's Globe 1542.

FROM PTOLEMY'S GEOGRAPHY 1552.

NOVAE INSVLAE XXVI. NOVA TABVLA.

Orbis of Grynæus. No advance has been made. Cuba is Isabella and the long, narrow, bolt upright island is still the land of Cuba, with Japan only seven hundred miles away.

Another ten years pass. On Honter's globe of 1542 for the first time Asia is represented as completely separated from America. South America is a large island called America, and North America is represented by the same narrow island and is called Parias.

Another ten years go by. The Ptolemy of 1552 shows the results of continued exploration of the coast line of North and South America and that is growing more correct. South America is broadened out east and west like a Chinese bird kite and its map name is the New World, or the Atlantic island called Brasil and America. The Amazon and the La Plata rivers are given, and the continent south of the straits. This continent, by the way, both on this map and on the Schöner globes of 1515 and 1520, probably owes its existence solely to conjecture from the fact that Magellan pioneered the way from the Atlantic ocean to the South sea by way of the straits, in his first circumnavigation of the earth in the *Victoria*, 1519 to 1522, and the size of the land to the south was evolved from the dreams of the map-makers. The name of Parias which has been found sometimes on the north-east of Brazil, sometimes on Central America, and sometimes on the upright pillar to the north of Cuba is here on the north-west coast of South America. The West India islands and Cuba are correctly given.

The land of Florida is the name here bestowed not only on the peninsula but also on a vast extent of country to the north, west and east of it. Hudson's bay is brought down so as to leave a narrow peninsula, the bay dividing the continent of North America into two almost equal parts, one called the land of Florida and the other Francesca. The old Columbian idea of the proximity of Asia is still preserved and Zipangu is the usual short distance from the American coast, and to the north of it is Cathay and India with the Ganges river, and the Ganges archipelago and its seven thousand four hundred and forty-three islands are carefully stated on the map.

It is now time to examine briefly the progress of discovery in the north. Omitting as beyond our limits in this paper, all discussion of the question of discovery of the New England coast in the year 1000 by the Northmen, and the visits to the coast of Labrador by the Zeno brothers in 1440, and the visits of ships from Dieppe, particularly to

South America, in 1487, and the visits of the Welsh in 1170, we call your attention to some later discoverers. I have mentioned the first visit to Labrador and Newfoundland by the Cabots, and spoken of the voyage of Sebastian Cabot, the son, along the coast to Cape Hatteras. But his examination of the coast south of Maine is strongly doubted by some of the best students of early American history, particularly by Henry Stevens, who gives substantial reasons for his opinion. One of the earliest maps, that of Juan la Cosa in 1500, is explained satisfactorily on this theory. La Cosa was a pilot with Columbus in 1494 exploring about Cuba. His map gives an accurate result of the geographical knowledge then obtained of the West India islands and also of the discoveries of the Cabots along Newfoundland, the Gulf of St. Lawrence and Nova Scotia. The question is, in regard to La Cosa's map, is the line from Nova Scotia a guess line of America, or the coast line of Asia? I am inclined to think with Henry Stevens that the pilot of Columbus adopted the theory of his leader and intended to put the east coast of Asia from Halifax or Cape Race. The map is valuable as the one nearest to the time of the discovery, and as containing the discoveries of Columbus, Vespucius and the Cabots.

On the Ribero map of 1529–35 we notice the inscriptions, "the land of Garay," "the land of Ayllon," "the land of Gomez," etc. In 1518 Francisco de Garay, the wealthy governor of Jamaica, fitted out an expedition of three ships on a voyage of discovery, and they skirted along the west coast of Florida, westward, along what are now the Gulf States to Texas. That accounts for his name on the Ribero map. The land of Ayllon is so called from Lucas Vasquez de Ayllon, who went on a voyage of discovery and kidnapping slaves along the coast of what is now Georgia and South Carolina, in the years 1529–1534. The designation of the land of Gomez in the Ribero map grew out of the voyage of discovery of Estevan Gomez of Portugal in 1525. As the shores of South and Central America and of the peninsula of Florida had been examined by Columbus, Vespucius, Ponce de Leon and Ayllon, and the extreme north by the Cabots for a western passage to Cathay, and unsuccessfully, Gomez undertook the same quest in the middle latitudes and examined the coast from about New York to Maine, and the Ribero map rewarded him, by placing thereon the name of the land of Gomez. But all this coast had already been explored in the previous year, 1524, by Giovanni Verazzano, a Florentine in the service of the king of France. As early as 1504 the French claim that their ships from Britany and Normandy

PART OF MUENSTER'S WORLD, from Grynaeus 1532.

A copy of a part of the map of the world made by Visconte de Maggiolo in Genoa in 1527. (The scale of latitudes was copied from one on another part of the map. The original in the Ambrosian Library, Milan, is twenty-three inches wide.)

[Copyright. "Discoveries of America." Weiss. G. P. Putnam's Sons. New York, 1880.]

Part of Orontius Fine's Globe of 1531, reduced to Mercator's Projection.

were accustomed to fish on the banks of Newfoundland. Verazzano in 1508, with Thomas Aubert, in two French ships, ascended the river St. Lawrence for eighty leagues. In 1524 he sailed from Dieppe in the *Dauphize* to discover new lands for the king of France.

His landfall was on the coast of North Carolina. He skirted along the coast northward, entered the Bay of New York and the mouth of the Hudson river (you will notice this was about fifty years before Henry Hudson was born), then skirted along the south coast of Long Island, supposing it to be part of the mainland, discovered Block Island, which he named Claudia, and then steered for France. His discoveries complete the coast line of North America, and his map of 1529 contains for the first time the name of Norumbega, one of the etymological puzzles of American geographers. In view of these facts it seems strange that some of the later maps which I have described, failed to display the results of his discoveries. But there is one map, brought to the attention of the students of geography by Mr. A. J. Weise of the neighboring city of Troy, which is remarkable for its correctness in delineating our coast line. It is also remarkable for having escaped the notice of geographers and writers during all the years of discussion until 1884, when Mr. Weise's book was published, entitled, Discoveries in America to 1525. It is the map made by the Viscount de Maiollo in Genoa in 1527, and is in the Ambrosian library in Milan. The name of Francesca is placed between two flags that mark the extent of Verazzano's explorations in 1524. The English flag marks the land of Cortereal and the Spanish and Portuguese flags mark the possessions of those countries. A strait across the isthmus of Central America makes two large islands of the continent, and a western line may be a guess coast line or may indicate the limits of the explored regions, leaving the extent of the interior undetermined. Yucatan, as usual, is given as an island instead of a peninsula. The West India islands and Florida have their correct positions. There can be no doubt of the fact that Verazzano did for France what Columbus did for Spain and the Cabots for England — that he was the discoverer of the middle portion of the coast line of the United States. The French nation was too much occupied in foreign wars to follow up their discoveries by colonization. But that they carried on a desultory commerce with the natives in these parts during the period between 1525 and 1608, when Henry Hudson first sailed up the river of his name, there is every reason to believe. The old map found in Holland, and which it is supposed was used by Hudson, has this inscription on it, written near the point where the Mohawk enters it at

Cohoes: "That as far as we can understand by what the Mohaks say and indicate, the French came with sloops as high up as their country to trade with them."

There are plenty of other maps and globes, but I have selected such as fairly show the stages of growth of geographical knowledge of our coast. It is almost pitiful to recall how they went out, those early navigators in their little ships, tumbling and tossing over tempestuous seas, battered by wind and wave, one after the other, with undaunted courage, each adding a little more to the stock of human knowledge and to the opportunities for trade and commerce. But their sacrifices and their deeds have made them immortal. Their mistakes are pardoned and they are remembered simply for their bravery and for the good they have done mankind.

WEEDS.

By CHAS. H. PECK, New York State Botanist.

[Read before the Albany Institute, April 7, 1891.]

What are they? Whence and how do they come? What characters give them supremacy over other plants; and how shall we deal with them? These are some of the questions to which your attention is invited, while they are briefly discussed.

In the common agricultural acceptation of the term, a weed is a flowering plant deemed worthless, troublesome or injurions to cultivated crops. In a broader signification the term is made to include plants, supposed to be of no special value, which grow in uncultivated or waste places even though they may never invade fields or cultivated grounds. It is not applied to parasitic fungi, however troublesome or injurious these may be to cultivated plants. It has sometimes been briefly described as "a plant out of place." This emphasizes the fact that a plant may be useful and cultivated in one place but an intruder and a weed in another. In this view of the case the crabgrass (*Panicum sanguinale*) would be considered quite in place in the meadow or pasture, but quite out of place in the garden or on the lawn. The dandelion (*Taraxacum officinale*) is sometimes cultivated in gardens as a pot herb, but when it invades the lawn it is regarded as a veritable pest. The purslane was also at one time cultivated as a pot herb, but now it is with us everywhere regarded as one of the most troublesome weeds of the garden.

It is because of the trouble they cause and the injury they do that weeds become objects of interest to cultivators of the soil. They look upon them as enemies whom they would gladly drive from their land or exterminate if it were possible to do so without too much labor. But in one view of the case they are not to be considered an unmitigated evil. Probably many a field would fail to receive the full and thorough cultivation necessary to enable it to produce its best results were it not for the stimulus to effort furnished by a vigorous growth of weeds. The farmer knows that if he allows the weeds to overrun his cornfield he will get but half a crop of corn. He therefore is forced to use the cultivator and hoe to keep down the weeds, and this en-

forced cultivation results in a far better crop than would be realized with neither weeds nor cultivation. The fertilizing influence resulting from the decay of weeds in the soil is not without its value, and it is generally considered better for fallow land to be shaded even by a crop of weeds than to be fully exposed to the direct influence of the burning sun. But these are only the few bright spots on a dark background, the small good that may indirectly come from a great evil.

The question might here be asked, How do weeds prove detrimental to growing crops? Chiefly in two ways. By taking from the soil the nutrient material which should be left for the cultivated plant, and by crowding and overshadowing this plant and thus depriving it of its necessary quantity of air and sunlight. There are a few cultivated plants so vigorous and rapid in their growth that if given a fair chance at the start they keep ahead of most weeds, and turn the tide of victory against them. Buckwheat, for example, is sometimes sown not only as a useful plant but as a powerful ally in subduing weeds. But as a rule cultivated plants are weaker than pestilent weeds and in the struggle for existence they yield to their more vigorous opponents unless aided by man. The law expressed by "the survival of the fittest" in this case gives the survival to the most unfit, so far as the purposes of man are concerned. It is an interesting fact that, to such an extent have a few cultivated plants learned to depend upon man for aid in the struggle for existence, if his aid should be withdrawn, we have reason to believe they would soon become extinct. As examples, wheat and maize, one a representative of the food plants of the Old World, the other, of the New, are nowhere known in a wild state, and when left to shift for themselves they nowhere become permanently established. Their dependence upon man for continued existence is even greater apparently than the dependence of man upon them for subsistence. But they furnish a very suggestive and beautiful illustration of the extent of the interdependence between man and cultivated plants. The welfare of each is dependent upon the other. So it would seem that man, who was once put in charge of the Garden of Eden to dress it and to keep it, has not been utterly deprived of the trust then committed to him. He is still made the keeper of a few plants, the relics, so to speak, of the long lost Eden. These he must protect against the thorns and thistles that the earth brings forth naturally and easily.

Whence do weeds come? Some are descendants of species native to the land, and they insist on their right to their inheritance. Others are immigrants from foreign countries and others still are settlers

from more or less distant parts of our own country. Plant seeds are scattered everywhere by various agencies. Nature abhors idleness even in the soil, and wherever there is a bare spot of ground large enough to admit a little rain and a little sunshine there plants are sure to grow, provided they can obtain the necessary food. The bitter weed and beggar-ticks are examples of native weeds; purslane, ox-eye daisy and Canada thistle, of foreign weeds, while the hairy Rudbeckia, sometimes called "yellow daisy," is a western plant that has migrated eastward and invaded our pastures and meadows, in which, in many localities, it is scarcely less abundant or less injurious than the ox-eye daisy.

Having made out a list of fifty species of plants which seemed to me to justly merit being called the fifty most troublesome weeds of our State, I found that thirty-six of these were immigrants from other countries, nearly all from Europe, while fourteen were native. From this it would appear that 72 per cent. of our worst weeds are of foreign origin, 28 per cent. native. But the foreign element in the whole phænogamic flora of our State is only about 16 per cent., thus showing a much larger proportion of introduced, naturalized plants to be troublesome weeds than of our native plants. On the other hand, by far the greater number of useful cultivated plants also have been derived from other countries, so that we get the good with the bad.

How are weeds introduced? Some plants have been brought here for cultivation, but have escaped to fields and way-sides and become established as weeds. The wild carrot (*Daucus carota*) and wild parsnip (*Pastinaca gativa*) are doubtless examples of this kind. The common and much detested purslane (*Portulaca oleracea*) was once cultivated as a useful plant, but though it is not now considered worth cultivating, in this country at least, it thrives in our gardens, and is one of our most annoying weeds. Corn spurry also (*Spergula arvensis*) was once cultivated in Europe for fodder, but with us it is known only as a weed. Some have been introduced as ornamental plants and have escaped from flower gardens and door-yards to fields and waste places. A comparatively recent introduction of this kind is the orange hawkweed, sometimes called "red daisy" and "devil's paint brush."

Many weed-seeds find their way into our fields in company with the seed we sow. Growers of seeds sometimes allow weeds to mature among their seed crops and, in gathering, these weed-seeds become intermingled with them and are planted with them in the fields. In this way pernicious weeds are many times unwittingly introduced upon farms previously exempt from them. In this way corn cockle

(*Lychnis Githago*) often gets into wheat fields; white daisies, plantains and buttercups, into meadows. Another fruitful source of infection is found in the manure that is spread upon the fields. The seeds of many weeds pass through the alimentary canal of horses and cattle, undigested and unharmed. From these seeds the weeds of the fields to which the manure is applied grow; they are cut and cured with the hay, fed to the live stock and again the pernicious seeds go to the fields to defile the hay and perpetuate the evil.

Some weeds find their way into the fields by the agency of the winds. Their seeds have a spreading downy appendage that helps sustain them in the air while the wind wafts them along to some distant resting place. The dandelion seed is an example of this kind. Other seeds, like those of the common silk weed (*Asclepias Cornuti*), not only have the downy buoyant support, but also a winged margin that catches the wind like a sail and so aids in the propulsion of the seed through the air. Others still, like beggar ticks (*Bidens frondosa*) and Spanish needles (*Bidens bipinnata*) are furnished with downwardly barbed appendages by which they cling to the clothing of men and the hair of animals, and in this way they sometimes steal a ride into the fields. In the burdock (*Arctium Lappa*) and the burgrass (*Cenchrus tribuloides*) the seeds are encased in an involucre armed with hook-tipped spines, by which efficient instruments of attachment they gain transportation in companies sufficient to form families or colonies of weeds.

Railroads are active agents in transporting weed-seeds from place to place. Plants that are evidently new importations from other localities are sometimes found along the lines of railroads. They are brought with freight, with loads of grain, by passengers, or are repeatedly whirled along by the rush of air that follows each fast moving train. It is said that in Kansas it is not uncommon to see peach trees growing wild along the sides of the railroads. The passengers eat the peaches while traveling and throw the pits from the car windows. The soil and climate being favorable to their growth, the trees tell the story of their origin. Such are some of the ways in which weeds are introduced.

This leads us to the consideration of some of the characters which belong to weeds and which enable them to become troublesome. Among these are great tenacity of life, vigorous, rapid growth, great power of seed production, longevity of seed, adaptation to varying conditions in soil, season or climate, and especially a strong root growth or its equivalent, a vigorous growth of subterranean stems.

All troublesome weeds do not possess all these characters, but they all possess some one or more of them. Any newly introduced plant known to possess any one of these characters should be regarded with suspicion. The well-known live-forever (*sedum telephiam*) is a good example of a plant tenacious of life. It does no good to dig it up or plow it up and leave it lying on the ground. It will grow again as if nothing had happened. It has been known to put forth branches while lying in the drying papers of the plant press. Some weeds quite tenacious of life may be killed by pulling them up or digging them up in a very dry time, but the live-forever is not one of them. It is sometimes seen growing in patches about stone heaps, or along the margin of outcropping rocks where the plants have been thrown, under the erroneous supposition that they could not live in such places. Fortunately this plant does not spread rapidly, and is not very abundant. The purslane, also, is very tenacious of life, and it is useless to attempt its destruction in wet weather by digging it up and leaving it on the ground.

Rapidity of growth is the chief characteristic which makes some weeds troublesome and difficult to exterminate. Their development is so rapid that they grow up and mature a crop of seeds almost before their presence has been noticed. Some biennials behave in this way. During the first season they form a mere tuft of leaves lying close to the ground and a stout root in which is stored an abundant supply of plant food. Such modest behavior attracts little or no attention, and the plant passes the season in safety. With the advent of spring it draws upon its stored supplies of food and sends up its seed bearing stem with great rapidity. Some annuals follow this example. The shepherds' purse is generally regarded as an annual plant, and, as such, it should perfect its seed and die in one season. But it is not unusual for it to commence its growth so late in the season that it scarcely has time to perfect its seed before winter sets in. It then patiently waits for the return of warm weather, having in the meantime developed a good, strong root, a thrifty tuft of leaves and the rudiment of a flower stem. As soon as the snow has disappeared, it begins its growth again, and before the garden is plowed it has perfected a crop of seeds. I have specimens of this plant in flower which were collected in the vicinity of Albany on the 30th day of March, 1890. The chickweed, though properly an annual plant, often lives through the winter and fruits early in the spring, so that he who would extirpate these double-dealing plants from his garden must be vigilant and active. The common groundsel (*senecio vulgaris*), is not

often found in cultivated grounds in this locality, but it is an excellent example of a quick-growing weed, as is indicated by the following instance: One or two plants appeared in a certain garden. The owner wishing to obtain good specimens for his herbarium, allowed them to grow a few days longer that flowers and fruit might be shown by the specimens. When visited again more progress had been made than was expected, and a few heads had already dropped their seeds. The plants were taken, and on the supposition that the seeds dropped would not germinate till the next spring, no further attention was given the matter. But a few weeks later, the owner of the garden happening to pass the place where the groundsel plants had grown, was surprised to find a plentiful crop of groundsel plants already mature and shedding their seeds. This was the second crop of the season and, with the rapid growth, indicates considerable capability for mischief in the groundsel. It is this ability to grow quickly that enables some weeds to spring up later than our cultivated plants, and yet soon to overtake and then surpass them in the race of life, and thus become injurious.

The capacity of a weed for mischief is often greatly increased by its ability to produce a great number of seeds. On an herbarium specimen of shepherd's purse of ordinary size, I counted sixty-five pods or seed vessels. There were twenty-two seeds in one of these. Supposing all the pods to have been equally furnished, the number of seeds produced by this plant would be 1,430. At the same time all the branches were yet terminated by tufts of flowers, the foundation for many more pods. One thousand seeds would be a very moderate number to be ascribed to one of these plants. The burdock, which has some reputation as a troublesome weed, and which is a much larger plant than the shepherd's purse, is much more easily controlled and much less to be dreaded, because its capacity for seed production is much less. The purslane produces numerous seeds, and this character, added to its tenacity of life, makes it a very formidable foe in gardens.

But not only the number of weed-seeds is a factor for mischief, but also their longevity. Some seeds, when buried in the soil too deep to germinate, retain their vitality many years, and if they are brought to or near the surface after lying dormant a long time, they revive and grow. In this way, the sudden and mysterious appearance of certain weeds in fields previously free from them is easily explainable. To this cause also the constant recurrence of weeds after careful efforts to exterminate them may be attributed. It is recorded that in a corner of a certain garden a single stramonium plant (*Datura*

stramonium) once grew and was allowed to perfect and drop its seeds. As was to be expected, an abundant crop of young stramonium plants appeared in that part of the garden the next summer. These were all carefully destroyed that they might not mature seed and perpetuate the evil. But the next summer another lot of young stramoniums appeared, though in diminished numbers. These were speedily destroyed as before. For ten successive seasons these plants came up in this part of the garden in constantly diminishing numbers, though none were permitted to perfect seed, and though no plants of the same kind were growing in other parts of the garden or in adjoining grounds. They were evidently all the result of the single seeding from the single plant first noticed. Each successive plowing brought a few seeds within germinating distance of the surface, and left others too deeply buried to germinate.

A weed that is at home on all kinds of soil, is more potent for mischief than one that is limited to certain soils. Couch grass or quack grass, as it is often called, grows readily in all soils, wet or dry, cold or warm, rich or poor, clay or sand. No locality is exempt from its annoying and unwelcome presence, and farmers everywhere are liable to suffer from its invasion. Bur grass, on the other hand, thrives only in sandy soil, and is troublesome to such only as own farms in sandy regions. The orange hawk weed has not made itself odious, except in hilly districts where the soil is of a gravelly character and rather wet and cold. Some weeds, like daisies, butter-cups and fleabane, are most harmful in meadows and pastures. They are easily kept in subjection in gardens and cultivated fields. Others, like the pig weeds, foxtail and pigeon grass, give little or no trouble in meadows, but are a great nuisance in gardens, corn and potato fields. They, like many other plants, prefer to grow in soil made mellow by the plow, and in such soil they quickly overrun most cultivated plants if not held in subjection by frequent cultivation.

But among the characteristics of troublesome weeds, probably a well-developed system of roots or underground stems gives more potency for evil than any other, especially if the weed is a perennial one. It is this that makes it so difficult to eradicate such weeds as Canada thistle and quack grass, and that gives them preëminence over others as foes of the farmer and gardener. As an immediate consequence of these large, long and well-developed roots, the plants that possess them are able to grow quickly, to spread rapidly and generally to endure severe drought successfully. In these ways they have a decided advantage over other plants, whether wild or domesticated,

that have a more feeble root equipment. Such plants, too, are most often perennial, and on this account are not easily overcome by those methods of warfare which may be successfully employed against annuals. Under favorable circumstances an annual weed may be exterminated from a field by simply mowing it before it has had time to perfect its seed. But not so a perennial. It may not be permitted to renew itself by seed, yet it may reappear indefinitely by sending up shoots from its roots or underground stems, if these are permitted to remain in the ground. Such plants also have the advantage of an early start in the spring. By this means they are able to monopolize the ground they occupy to the exclusion of those plants which start later in the season. The rule of "first come first served" is carried out to the letter in this case, and the result often is that those not first are not served at all. The wild carrot, burdock, dandelion and yellow dock are examples of weeds that have long tap-roots which penetrate the earth deeply, and therefore sustain the life of the plant successfully through protracted periods of dry weather. These roots make it difficult to eradicate the plants, and if they are cut off at or near the surface they quickly send up new shoots. When Canada thistles are pulled from the ground they appear to have a long tap-root, but he who expects to be rid of them by pulling them will be disappointed. These long, deeply-penetrating roots are really upright branches from deep-laid, horizontal root-stocks. These root-stocks are so deeply buried that usually they are not disturbed by the plow nor affected by dry weather. In due time they send their branches to the surface, and a crop of thistles rises from the soil as if by magic. At the same time the root-stocks are extending themselves horizontally and increasing the area occupied by the thistles. This process can only be stopped by destroying their life or by digging them out of the ground. In this peculiar root-system we find an explanation of the great power this plant has for mischief, of the great difficulty experienced in exterminating it, or even in keeping it in subjection, and the real cause of the unenviable reputation it has everywhere acquired.

The plantain has fibrous roots which make up in number what they lack in size. They do not penetrate the earth very deeply, consequently the plant may sometimes be overcome by severe drought; but the roots cling to the soil most tenaciously, and the life of the plant is not easily destroyed by ordinary means. If buried quite deeply by the plow it will in time send its leaves to the surface again. It cannot easily be dug up or pulled from the ground. It well merits a place among the very troublesome weeds. The sheep sorrel (*Rumex acetosella*) has

very slender creeping and branching root-stocks. Though almost thread like, they grow rapidly and spread extensively, throwing up numerous leaf-bearing shoots to the surface and making a veritable pest of the plant in soils favorable to its growth. Owing to the slender character of the root-stocks they are easily broken in pieces in efforts to eradicate them. Each piece if left in the ground will originate a new plant. It is decidedly troublesome.

Even those annual plants that are most troublesome usually have a peculiar root development by which they cling to the soil most tenaciously. They are pulled out only with a great expenditure of strength and often of patience, for unless the soil is very mellow or softened by an abundance of rain, the stem is far more likely to break and leave the roots in the ground than it is to draw them out of it. Of course in such cases it is far better to destroy the weeds when young than it is to wait till they have gained a firm foothold in the soil.

Having now considered the source of weeds, the methods by which they find their way into gardens and fields, and some of the characters of the most troublesome kinds, let us turn our attention to the methods of opposing them. These may be classed as preventive and destructive. In this as in other cases, an "ounce of prevention is worth a pound of cure." It will be for the advantage of the farmer to be watchful against the introduction of weeds or of weed-seeds into his land. If he can keep weed-seeds out of his soil his farm will be free from weeds and he, from the necessity of destroying them. Inasmuch as weed-seeds are often introduced into fields by sowing impure seed, it is of the utmost importance that grass, grain and clover seed should be carefully examined before sowing and if found to be foul with weed-seeds it should either be cleansed or returned to the dealer from whom it was purchased. It would seem that it might be profitable for some wholesale seed dealer to make a special effort to establish a reputation for selling only clean seed. He should employ an expert, whose business it should be to examine closely every lot of seed purchased, and he should sell none that could not be guaranteed free from weed-seeds. He might do much toward stimulating seed growers to keep their seed clean, by offering a slight advance over market prices for all lots of seed purchased that should be found pure and clean. It would seem that as soon as it was generally known that he was selling only pure seed he would immediately take precedence over his less careful competitors, both in the amount of his sales and in the prices he could command for his commodities.

Seedsmen and florists should be careful not to introduce as ornamental plants such as are likely to escape to the fields and become pestilent weeds. Farmers' wives and daughters should keep a close watch upon any new ornamentals of the flower garden and, if they manifest a disposition to be too aggressive, they should destroy them at once. Especially should this be done if the plants possess any of the characters that distinguish the most troublesome weeds. It would have been far better that our flower gardens had never known the orange hawk-weed than that we should now have it as an additional pest in our pastures and meadows.

The fact that many weeds find their way into the fields in barnyard manure should afford an additional incentive to the farmer to keep his meadows free from weeds. If there are no weeds in the hay and no weed-seeds in the grain fed to stock, there will be no weed-seeds in the manure and it may be spread in the fields with unalloyed pleasure. Much may be done toward diminishing the number of weed-seeds in the manure by early mowing. Meadows sprinkled with daisies and buttercups should be mowed before these ripen their seeds. Meadows that have become filled with them should be plowed up, enriched with clean barnyard manure or commercial fertilizers, planted with crops which will admit of cultivation that the soil may be cleansed from weed-seeds. When this has been done it may be seeded down again with clean grass seed. A long step may be taken toward securing pure hay and clean meadows by putting the soil in excellent condition both as to fertility and friability before seeding, so that the grass shall be able to make such a dense and vigorous growth as to choke down or crowd out all intruding weeds.

Many weeds grow along the roadside. These are a constant menace to the neighboring fields. To overcome this danger as far as possible a law has been placed upon the statute books of this State, requiring the destruction of all noxious weeds, briers and brush growing along and within the bounds of the highway, twice in each year; once between June 15th and July 1st and again between August 15th and September 1st. This law is so little observed that in many places you would not suppose the inhabitants to be aware of its existence. A man who will not destroy the weeds in his own fields can hardly be expected to destroy those along the highway unless compelled to do so. It is therefore made the duty of every person or corporation owning or occupying under a lease of one or more years, the lands bordering the highway, to cut or destroy these weeds according to the law. It is the duty of the overseer of each road district to enforce the law,

and to give written notice to the owner or occupant, and if he neglect for ten days to do the work the overseer shall employ some one to do it and report the amount expended to the commissioner of highways, who in turn certifies the amount to the supervisor of the town, and by him it is put in the tax levy and charged eventually to the land whose owner or occupant should have destroyed the weeds. In like manner and at the same times, railroad and turnpike corporations are required to destroy the weeds along their roads, and the State's agents in charge of the canals must cause to be cut or destroyed the Canada thistles and other noxious weeds growing on State lands along the canals. These laws are good so far as they go and, if faithfully observed, they would go far toward improving the appearance of our highways and diminishing the sources of weed infection of our fields. But where people profess to observe it, they seem to think that all that is necessary is to mow or cut down the weeds. There are many perennial weeds that are not destroyed in this way, and some that are not even kept from perfecting seed by the mowings at the times assigned, so that if the law is not fully kept in spirit, as well as in letter, it will accomplish but part of the work it was apparently designed to do.

Let us now consider briefly some of the means and methods employed in destroying weeds. These may include the application of destructive substances, the cherishing of parasitic fungi injurious to weeds, the employment of domestic animals, the cultivation of quick-growing, vigorous, useful plants, pulling by hand, cutting with scythe or mower, suppressing or destroying with hoe, rake, harrow or cultivator, and burying beneath the soil with the plow. Some judgment should be exercised in order to select that method in each case which is best. Sometimes one, sometimes another, will be better, according to the kind of weed, place of growth, size, abundance, tenacity of life, etc.

Weeds growing along the margin of a sidewalk may be killed by a liberal application of salt, but it would not be desirable to destroy weeds in gardens among cultivated plants in this way, for the good and bad would perish alike. It may be necessary to pull by hand a few small weeds along the rows of carrots, beets or onions, but it would hardly be wise to attempt to clear a meadow of an abundant crop of daisies in this way. It is, at best, a slow and tedious method, and should be employed only in cases where it is necessary, or where, from the limited number of weeds, it can be most quickly and satisfactorily done. A few troublesome weeds are attacked by parasitic

fungi. Though these do not destroy the life of the plant outright, they generally weaken it enough to prevent seed production, either wholly or in part, and in this way the fungi aid in preventing the propagation of the weed species. These fungi should therefore be regarded as friendly allies and cherished as such. Purslane, shepherd's purse, Canada thistle and bur grass are weeds that sometimes suffer from the attacks of parasitic fungi.

Domestic animals are sometimes available and very serviceable as destroyers of pestilent weeds. Sheep readily eat many of the weeds of pastures, and have acquired a good reputation as weed exterminators. Hogs also are sometimes utilized in destroying patches of the notorious and almost invincible live-forever. If they have access to this plant they will soon root it out and destroy it. They are also said to be fond of the creeping subterranean stems of the much-detested quack grass, and doubtless they might successfully be employed in exterminating it. Cultivated plants are sometimes wisely and successfully used as an aid in overcoming noxious weeds. A field is badly infested by weeds. In early summer, after these have had time to commence their growth, and the weed-seeds lying on or near the surface have germinated, the field is plowed and fertilized. Buckwheat is sowed. This is a crop which grows quickly and covers the ground completely with its dense mass of branches, foliage and flowers. Any weeds, from seeds that may have been brought to the surface in the plowing, or that may spring from perennial roots, are soon overshadowed, and being deprived of the necessary air and sunlight, they gradually give up the struggle and die.

In the case of annual plants growing in pastures and waste places, the theoretical method of easy and rapid destruction is to mow them before they have developed their seeds. This mode of destruction is based on the fact that such plants live but one year, and if they are not permitted to perfect seed they cannot possibly appear the next season. But it will not do to put too much confidence in this method. However good it may seem in theory, it is liable to fail in practice. A crop of annual weed-seeds may not all germinate the first season after their sowing. Some may lie dormant till the second season and then spring into life. I have already mentioned examples of annuals that sometimes commence growth late in the season and renew it again the following spring, thus behaving like biennials. Mowing down an annual or a biennial before it has perfected its seed often checks it only for a time. It again sends up stems which will bear fruit unless again cut down. This mode of destroying the wild carrot has some-

times been recommended, but in practice it will be found that this plant will require many successive mowings to prevent it from perfecting seeds. The stems formed after each mowing will, it is true, be successively shorter and shorter till at last they will be too short to mow readily, especially on uneven ground, but they will nevertheless blossom and bear fruit. Some annuals grow in such a prostrate manner that it is not possible to mow them so that they shall not mature seed. Formerly the hoe was extensively used in destroying weeds in gardens and fields, but at present its use has largely been superseded by the use of the plow, the harrow and the cultivator. When weeds are to be kept down or destroyed in whole fields or over extended areas, probably there is no more satisfactory method of doing it than by the judicious use of these instruments. Probably there is no weed that invades our fields that cannot be overcome in one season by their faithful and intelligent use. It is now recommended that gardens even be planted in long rows sufficiently far apart to permit the free use of the horse cultivator in keeping down the weeds. Even with the hand cultivator they can be destroyed much more rapidly than with the hoe; but this necessitates their destruction while they are yet young and small. But this is as it should be. The rule should be to kill them as early as possible. The earlier the better. Much labor is thereby saved. The best farmers do not allow the early crop of weeds to show themselves above ground. They kill them before they come up. This is done by frequently stirring the surface of the soil in their cultivated fields with the harrow and the cultivator. The latter is kept in use at frequent intervals till the crops are too large to permit cultivation any longer; then by shading the ground they themselves do much to retard weed growth.

But there are certain annuals that take advantage of this cessation in cultivation and make this method of weed destruction imperfect. These weeds are very hardy, they commence growth late in the season, develop rapidly, endure considerable shade and frost unharmed and perfect their seeds before freezing weather kills them. They are the autumnal occupants of gardens, corn fields and potato fields. They are the bitter weed, knot weeds, pig weeds, crab grass, old witch grass, barnyard grass, yellow fox tail and green fox tail grasses. They are all or nearly all quite tenacious of life and if pulled up and thrown upon the ground in wet weather they will take root again and perfect their seed. Probably the most available method of destroying them would be to plant corn and potatoes or other cultivable crops in rows far enough apart to permit of continued, shallow cultivation so late in

the season that these weeds could not have time to perfect their seeds. It sometimes happens that whole fields become badly infested with perennial weeds of the most troublesome character, like Canada thistles and quack grass. The situation then is a serious one. The roots or subterranean parts of the plant must in some way be taken out of the soil or killed while remaining in it. The latter is sometimes thought to be the easier task. The mode of procedure is based on the fact that the whole plant is nourished by material elaborated in the leaves. If then the roots or subterranean parts can be continuously deprived of their leaves or prevented from expanding them in the air and sunlight they must in time starve to death. With a deep running plow the weeds are completely buried out of sight. The roots attempt to send new shoots to the surface but before these break through into the light they are again turned under by the plow. The faithful repetition of this process through the season, never once allowing a green leaf to appear above ground, will put an end to the most persistent weed. But it involves the loss of the use of the land for the season, besides a heavy outlay of labor. To make it less expensive, this treatment is sometimes supplemented by enriching the soil and sowing it with buckwheat in midsummer or with rye or other winter grain in early autumn. After the weakening the weed-roots have received during the first part of the season these crops are generally sufficient to overshadow and choke down any feeble weed-shoots that may succeed in reaching the surface. The repeated plowings required by this process and the decay of the weed-roots in the soil serve to put the land in excellent condition for future crops and in a measure to reward the owner for the extra labor bestowed. It may be stated that even this crowning remedy for weed troubles has its limitations. It is scarcely available in heavy clay soils in excessively wet seasons like that of 1889. The land should be in tillable condition when the plowing is to be done. In excessively wet seasons many a farmer whose land is clayey and well stocked with weed-seeds, is, to a great extent, at the mercy of weeds, and they are not slow in taking advantage of the situation.

However valuable special methods of overcoming weeds may be in special cases, probably one of the most efficient factors in the general prevention and destruction of weeds is to be found in the enrichment of the soil and in good cultivation. The best farmers are those who give special attention to these two points. In consequence, their fields bear the largest crops and the fewest weeds. They supply their soil with an abundance of plant food, and give it a thorough and frequent

cultivation. These requisites of good crops are at the same time destructive to weeds, for the former gives health and vigor to the cultivated plant and make it an ally against weed growth, and the latter, while it stimulates, encourages and quickens the growth of the cultivated plant, at the same time prevents and destroys the weed growth.

That the burden imposed upon the agricultural interests of the country by these cumberers of the ground, is immense, no one will deny. Freedom from this burden is very desirable, but it, like any other good, can be had only by effort and labor. Its attainment will require some general knowledge of the character and habits of the enemy, and some exercise of judgment in selecting the best means of warfare, some vigilance in preventing new invasions, and much united, faithful and persevering effort in exterminating those weeds already established. But the end sought is a grand and good one, and is well worth the labor necessary to attain it.

THE STANDARD OF VALUE.

By CHAUNCEY P. WILLIAMS.

[Read before the Albany Institute, April 21, 1891.]

The standard of value! What is a *standard* of value? The question will be variously answered. The technical philosopher will very likely tell us that there is — there can be — no such thing as a *standard* of value. A *standard*, must be something fixed and invariable. All values change. A *changeable standard*, he will tell you, is an absurdity — a misnomer.

Yet, mankind through all history have, in practice, adopted something as a measure of values. It is a necessity of human association. The existence of such a measure or the want of it has, through all ages, marked the dividing line between the advanced nations and those sunken in barbarism. It is a necessity of commerce — of the interchange of all the products of industry.

While in different times, many objects have served temporarily as such measure, the general concensus of mankind, from the earliest periods of history, has decided upon the metals gold and silver, as the objects best adapted for such measure or standard. For more than four thousand years of authentic history, these metals have served as such standard for the most advanced peoples of the earth. In the Mosaic records of the placing of Adam and Eve in the garden of Eden, the land of Havilah is spoken of as the land "where there is *gold*," and it is certified that "the gold of that land *is good*." (Genesis ii, 11, 12.) Nearly two thousand years before the Christian era, Abram traveled from Ur of the Chaldees to Canaan; and, after passing down into Egypt, and returning, he is said (Gen. xiii, 2) to be "very rich in cattle, in silver, and in gold." By the laws of Menes (variously regarded as dating from about 3000 to 3900 B. C.) gold and silver seem both to have been settled as money in Egypt, and their ratio of relative value by weight, is prescribed as two and one-half of silver to equal one of gold. (Faucher, page 11.) Delmar thinks that gold was the first metal produced by man. (*History of Money*, page 2.) Strabo tell us that gold and silver were in use as money in the East in the very early ages, and that the relative value of the two metals

was two of silver to one of gold. (Delmar — *Precious Metals*, 239.)

It is evident therefore that gold and silver through all ages of civilized man have been accepted as the best material for measuring values. It is also evident from an examination of history, that while in some parts of the world in the very early ages, silver was valued *higher* than gold, and that among all peoples of the early historic ages, silver was counted of much higher value compared with gold than its present relative value. There is no doubt that the discovery and the working of gold preceded that of silver. Gold is found in the pure state; silver, nearly always in combination with other substances, requiring skill, machinery, and some chemical knowledge for its extraction.

History makes it evident, also, that the quantity of silver production of the world, has pretty steadily increased over that of gold; and, further, that the relative values of the two metals have, from the earliest times, through the ages, kept pretty even pace, in inverse ratio to the production. M. Leon Faucher, writing about forty years ago, says:

"When we seek to examine minutely the various monetary changes which have occurred, and to lay hold of some principle to guide our inquiry, we quickly recognize the fact that the difference in value between gold and silver increases in proportion to the development of civilization and industry." (*Remarks on Production of the Precious Metals*, page 9.)

We accordingly find that the modern appliances of machinery and steam power, with scientific and chemical knowledge, are brought into requisition to cheapen and largely increase the production of silver; while gold is still chiefly the product of individual personal labor, as of old. There is every reason, therefore, in the nature of things, why the modern ratio of value of the two metals should be wider apart than formerly; and that this ratio should continue further to widen. There is good reason to believe that the quantity of silver which, two centuries ago, cost a dollar to produce, is now readily produced at a cost of fifty cents. And this, although the wages of labor *have quadrupled in the mean time.* The same cannot be said of gold production in any thing like equal degree.

As the general judgment of the nations had thus early led to the adoption of gold and silver as the medium of effecting the exchange of the products of labor, of manual service and objects of desire; the next step of progress was the deciding upon some means of determin-

ing quantities of these metals to be given as the equivalent of other values. It was, evidently, determined that such quantity should be settled by weight. In the early ages of the world, probably, all money of gold and silver passed in exchange *by weight.*

We are told that Abraham, at the death of his wife Sarah, negotiated with the children of Heth for a burial place, and bought of Ephron the Hittite, the field which was in Macpelah, which was before Mamre, and the cave which was therein, and all the trees that were in the field; "and Abraham *weighed* to Ephron the silver which he had named in the audience of the sons of Heth, four hundred shekels * of silver, current money with the merchant." 1860 B. C. (Gen. xxiii, 16, etc.)

When the sons of Jacob were forced to visit Egypt a second time to buy food, because the famine was "sore in the land" of Canaan, and they were brought into Joseph's house, they communed with the steward and said, "we came indeed down at the first to buy food. And it came to pass when we came to the inn, that we opened our sacks and behold every man's money was in the mouth of his sack, our money *in full weight.*" 1707 B. C. (Gen. xliii, 20, 21.) Speaking of wisdom, Job says: "It cannot be gotten for gold, neither shall silver be *weighed* for the price thereof." 1520 B. C. (Job xxviii, 15.)

A recent traveller in Persia (Mr. Geo. Douglas Miller) tells us that in that country silver and gold coins are quite commonly *weighed* when received in business transactions, at the present day. The same practice is common in China.

The prophet Jeremiah says: "And I bought the field of Hanameel my uncle's son, that was in Anathoth, and *weighed* him the money, even seventeen shekels of silver." 590 B. C. (Jer. xxxii, 9.) The prophet Zecheriah says: "And I said unto them, If ye think good, give me my price; and if not, forbear. So they *weighed* for my price thirty pieces of silver." 487 B. C. (Zech. xi, 12.)

So it appears that for one thousand four hundred years of early Jewish history, it was the common practice to *weigh* the precious metals in their use as money. Profane history furnishes us evidence that in the other nations of antiquity, these metals also passed by *weight.*

In the processes of evolution of the money metals as a standard of value, it is apparent that somewhere between about one thousand and

---

*The shekel was a Hebrew weight equal to two hundred and nineteen grains Troy; equal, therefore, in silver at our present coinage value to about fifty-nine cents. Fessenden's Encyclopedia of Religious Knowledge, Brattleboro and Boston. 1835. Art. shekel.

five hundred before the Christian era, the idea was evolved that if a piece of gold or of silver was to be moulded into certain form and to receive a reliable stamp indicating its weight and fineness, it would add greatly to the convenience of commerce. Hence arose coinage. And hence we find that about the dates above stated, India, Persia and Greece issued coined money; and later Rome also issued coins. These coins generally represented weights, and many of them took the *name* of weights.

Later nations have also formed their coinage systems on the basis of weights. Charlemagne in the ninth century, and England, after the conquest, made the *pound weight* of silver (the Rochelle pound or Tower pound) their unit of money for the expression of value; although I believe neither ever issued a coin of silver more important than for a fraction of the pound.

The use of the money metals in coinage as standards of value, seems to have become settled on a solid basis, when a new form of fraud is invented. The people among the comparatively modern commercial nations have, through generations, become accustomed to the use of certain coins *by name;* when it occurs to the reigning sovereign that he may turn a penny—honest or otherwise—by lightening the weight of metal in the current coin or in debasing its quality. The prerogative of coining money is made to reside solely in the sovereign. The new coin, at first only slightly decreased in weight, is declared by royal decree of equal value to those in circulation, and they pass without serious question. Encouraged by this trial, the ruling authorities next order a recoinage, cutting off a considerably larger fraction of the weight of the coin, the decree of the crown again ordering the new coin to be taken and paid out, under the *same name* and at the *same value*, as the older coin. So the successive diminutions of the coins of the realm go on from time to time, until at last the *pound* gets to be the mere fraction of what its name originally indicated, and the people have been defrauded out of the entire difference.

William the Conqueror in the eleventh century established the pound weight of silver, nine hundred and twenty-five parts fine, and seventy-five parts alloy, as the standard of value for England. It so remained for two and a third centuries when, in the year 1300, Edward I began the game of debasing the standard. It is true he exhibited great modesty in the extent of his plunder. He only coined the pound weight of standard silver, which had heretofore been represented by twenty shilling coins, or by two hundred and forty pennies, into twenty shillings and three pence, a debasement of only one

and a quarter per cent. Compared with the later crimes of the same sort, it bears the relation of petty larceny to the work of the highway robber. But, he sets the example, which his successors are not slow to follow. Edward III, in 1345, orders the pound of silver coined into twenty-two shillings two pence, and two years later into twenty-two shillings six pence, and in 1354 into twenty-five shillings. And so, the work of depreciation having been gotten well under way, it goes on, until in the reign of Edward VI in 1550, the pound weight of fine silver, through debasement of the standard of quality and reduction of weight, a pound Troy* of silver, is coined into two hundred and sixty-six shillings, eight pence; and the (£) pound sterling, is made to contain only about eight per cent of its original weight of silver, as twenty shillings is at all times the legal pound. It is creditable to the English people that a large part of this debasement of the standard was corrected in restoring the coinage under Queen Elizabeth, to represent about one-third of its original value, by the coinage of the Troy pound of the old standard silver, first into sixty and later into sixty-two shillings; at which it remained until 1816, when the weight of the shilling was lessened, for the purpose of making the silver coin a subsidiary currency, and no longer a standard of value.

The monetary history of France exhibits a similar, and even a much greater degradation; which also applies to Italy and the most of central Europe. Under Charlemagne about the beginning of the ninth century the livre or pound — *i. e.*, the Rochelle pound† weight of silver, was established as the unit of money, and the standard of value. The successive depreciations of the coinage — commonly called in Europe "*the raising of the moneys*," by the rulers succeeding Charlemagne, have brought the coinage of those countries down to so ridiculous a result that the *livre*, or "pound" at present in circulation, contains less than one and a half per cent of the quantity of pure silver originally contained in the *livre* of Charlemagne. And yet, through all these debasements of the weight of the coins through the ten centuries and more, since Charlemagne, the *name* — "*livre*" — has been retained; and (excepting with France) is still retained by these countries. France seems to have regarded the designation of "*livre*" to a coin containing the ridiculous fraction of only about

---

* The mint weight had been changed by Henry VIII, from the Tower pound to the Troy pound, which was three-fourths of an ounce heavier.

† The Rochelle pound was the exact equivalent of the Tower pound of the English.

one-seventieth its weight, as not quite creditable to her monetary system, and so changed its name to that of franc.*

The latest of England's tampering with her standard of value was under Queen Elizabeth about 1601. England was then just entering what proved to be the stormiest century of her history — the century also of some the brightest minds of her sons — of Bacon and Shakespeare, of Cromwell and Hampden, of John Milton and of Locke and Newton, in the lists of fame; and of Strafford and Laud and the Star Chamber Court, on the rolls of infamy. The questions to be settled

---

* Delmar (*History of Money in Ancient Countries*, London, 1885, pp. 202, 203), says: "As for the notion that the coin or sum livre of France ever weighed a livre weight, or the coins or sum pound sterling of England ever weighed a pound weight, there is no warrant for it in fact." And Delmar goes into considerable length of explanation of the reason of the above assertion.

On the other hand *Lowndes* (*Report for the Amendment of the Silver Coins*, London, 1695) quotes from the "Black Book written by Gervaise of Tilbury in the time of Henry II," which he calls "a book of great authority, remaining in the exchequer," in speaking of the orders of King William I for the paying of his warriours, that they "should not only be paid" (I quote from Lowndes), "*ad Scalem*, but also *ad Pensam*, which latter was the paying as much money for a pound sterling, *as weighed twelve ounces Troy*."

Lowndes at this time (1695) was secretary of the treasury, and ought to know whereof he affirms. Later on in his report Lowndes quotes from the indentures of the mint after this fashion which I copy, (date 28 Edward I, A. D. 1300.) "An Indented Tryal-piece of the goodness of Old Sterling was lodged in the Exchequer, and every Pound weight Troy of such silver was to be shorne at Twenty Shillings Three Pence, according to which the value of the silver in the Coin, was One Shilling Eight Pence Farthing an ounce." This is stated as the *first* debasement of the English coinage from the former coinage of 240 pence to the pound weight of silver under William the Conqueror and his successors down to Edward I. And so Lowndes goes on through all the successive tamperings of the different sovereigns with the standard of value, down to his own time — in each case stating from the mint indentures, that "a pound weight of the old sterling silver" was to be coined into so many (as stated) of the different coins.

Lord Liverpool also (letter to the king on the coins of the realm, first published 1805, London, 1880), says: "At the accession of William I to the throne of England, the pound in tale of the silver coins current in his kingdom, was equal to the pound weight of standard silver; that is, the Tower pound before mentioned." The Tower pound before mentioned, he had explained to be the same as the Moneyers pound, and the Rochelle pound, and was lighter than the Troy pound by three-fourths of an ounce Troy. The Troy pound contained 5760 grains and the Tower or Rochelle pound 5400 grains. Henry VIII in the eighteenth year of his reign — 1527 — abolished the Tower pound from the mint and established the Troy pound in its stead. This fact needs to be taken into account in all comparison of weights before and after that date.

were, for the most part, of too serious a nature to admit of tampering with the currency.

But, as the century drew toward its close, the circulating coin of the realm was found to be in very dilapidated condition, through the clippings of the dishonest, and the wear of long use. William of Orange had just been established on the throne and something of stable government seemed to be dawning on the horizon. The condition of the coins attracted the attention of the Parliament and people. Lowndes, the Secretary of the Treasury, was called on for a plan of cure. He replied by a report to the Lords of the Treasury recommending re-coinage, raising the value of silver twenty-five per cent, citing the history of the previous coinages in which similar action had been taken, and claiming further justification in the exigency of the extreme depreciation in weight and real value of the silver coins in circulation. The actual depreciation of the circulating coins as proven by the weighing £221.418, in the condition they were received at the Exchequer was shown to be more than forty-two per cent. Mr. Lowndes' proposal was that the expense of the restoration of the coinage should be, in the manner he suggests, shared between the present owners and the Treasury. Through the influence of Locke and Newton, the scheme of Lowndes was defeated, and it was decided that the coinage should be restored to its full legal weight, at the public expense. A decision based in justice, and prompted by wisdom and sound economy! Mr. Locke published several essays on the subject which have come down to us. The result is a triumph of sound reason and sound economy, over that short-sighted financiering, which expects to make itself rich, as Macaulay says, "by *calling ninepence a shilling.*"

This re-coinage of the English currency under William and Mary in 1696–9 marks an important era in the evolution of the standard of value. Sir Isaac Newton, after making the greatest scientific discovery of all the ages, was made warden of the mint, and, thereafter, something of scientific system is to govern the coinage of money in England. From this date *credit* becomes an important factor in the affairs of civilization, and its use adds in many fold degree to the importance of a *stable standard* of value. It is, too, the era of the inception of *national debts*, which since have grown to such towering importance in their magnitude.

Prior to about this period the commerce of the world had consisted almost wholly of the exchange of products for payment at once in other products, or for their equivalent in money. Money — the standard of value — has, up to this time, served but little purpose other than

its most obvious one, viz., as an instrument of exchange. With the introduction of credit and the practice of borrowing and making loans, payable at a future period, and in many cases at the end of a long term of years; or, as in case of the English debt, without condition as to the time of payment; it is manifest that the *standard of the money* in which the debt is to be paid, becomes of vastly increased importance to both creditor and debtor. It will not do now to call a coin or a sum of money *a pound*, and, during the term of these loans, reduce it to a third or to a thirtieth of its substance, and still hold it to be the same value contracted for, because it bears the same name. To the honor of the British nation let it be proclaimed that from this period down, the standard of the currency was unchanged, except by the gradual steps toward the transfer of the standard of value from the silver to the gold basis, which was completed in 1816. And Great Britain has found her abundant reward for this fidelity to an honest and stable standard of value, in that her chief city has been made the center of the world's exchanges for nearly two centuries as its result.

I have thus at some length traced the history of the evolution of the standard or measure of values, to show that by the general consensus of the civilized nations of the earth, gold and silver have been fixed upon as the best materials for such measure; and that as the nations advance in commercial intercourse and in industrial progress, and especially as credit and loans on long time become prominent in the relations of individuals and of nations, the indispensable necessity of a stable and invariable measure of values becomes of transcendent importance.

A brief review of our own monetary history as affecting the standard of value, will now be appropriate.

The monetary system of the United States was established shortly after the inauguration of the government under the Constitution. under the advice of Alexander Hamilton, who was then Secretary of the Treasury, in his report to Congress, January 28, 1791. Hamilton had studied his subject with care, and he aims to decide all the questions involved in its consideration, with reference to the relative values of gold and silver throughout the world. He says: "Contrary to the ideas which have heretofore prevailed in the suggestions concerning a coinage for the United States, though not without much hesitation, arising from a deference for those ideas, the secretary is. upon the whole, strongly inclined to the opinion, that a preference ought to be given to neither of the metals, for the money unit. Perhaps, if either were to be preferred. it ought to be gold rather than

silver." And he predicts that "the revolutions which may take place in the comparative value of gold and silver, will be changes in the state of the latter, rather than in the former." He further says: "There is scarcely any point in the economy of national affairs, of greater moment than the uniform preservation of the intrinsic value of the money unit. On this the security and steady value of property depend." (*Hamilton's Works*, 1850, vol. 3, pp. 155, etc.)

Congress, on Hamilton's advice, established the coinage of the United States on the ratio of fifteen of silver to one of gold. This ratio, although conforming closely to the then European ratio of valuation of the two metals, soon proved to be an over-valuation of silver. Both gold and silver were made equally a legal tender, and a measure of value.

This ratio was changed in 1834 owing to the depreciating value of silver, to about sixteen to one, by which gold was over-valued. This change was made by reducing the weight of the gold coin something more than six per cent.* This was in fact a depreciation of our standard of value to that extent, to keep pace with the actual depreciation of silver in the world's markets.

In the organization of the mint, Congress had provided that the fractional coins should be exact aliquot weights and of the same standard of fineness as the dollar coin, and they were equally a full lawful tender. Owing to the French mint offering full free coinage to all holders of either metal at the ratio of 15.5 to 1, it was now found that most of our fractional coins, as well as the dollars, coined by the mint, were being drawn off to the European mints, attracted thereto by the something more than three per cent of pure silver metal contained in them over the French coin. Meantime our own circulation of fractional silver as well as the dollar coin was filled up with Spanish and Mexican coin — mostly in a much worn condition. This state of things induced Congress in 1853 to reduce the *weight* of the fractional coin nearly eight per cent, and limiting its legal tender capacity, to insure its retention at home. From this time our fraction silver coin supplied the circulation, and the heterogeneous mass of foreign silver coin vanished from the country.

These are the only changes in our coinage affecting the relations of gold and silver down to 1873, when it was decided after long deliberation through two Congresses, to drop the coinage of the silver dollar. Down to this time, through eighty years of our history, during the

*6.18181 per cent.

whole of which time the mints were open to the *free coinage* of both gold and silver to all comers, we had coined of legal tender silver, $84,752,319, and of gold, $983,159,695.

Of the above amount of silver, only $8,045,838, of the dollar coin were struck, and nearly one-half of this number (exactly $3,827,268) were coined during the suspension of specie payments, 1862 to 1873, when nobody in our own country used the silver dollar, except as a curiosity to be stowed away in coin cabinets. Nearly six millions also of this total of legal tender silver coins (exactly $5,877,077) consisted of five and ten-cent pieces, which, notwithstanding their insignificance as single coin, were chiefly sent to Europe at a premium, for re-coinage. The curious fact stands on the pages of our statistics, that down to 1853, when the coinage of fractional coin, as aliquot parts of the dollar ceased, our mints had coined more than double in value of five and ten-cent coins to the value coined of the vaunted silver dollar; the exact relation of the two being, of five and ten-cent pieces, $5,877,077; and of the dollar coin, only $2,506,890. Thus it will be seen that, during the first sixty years of the working of our mints, only two and a half millions of the standard silver dollar were coined; and only $4,218,670 in the total of the dollar coin were struck before the suspension of specie payments on account of the war in 1862. It will readily be seen from this narration how misleading is the accusation of the present advocates of the free coinage of the silver dollar, that this dollar was the cherished "DOLLAR OF THE FATHERS." The truth is that the Spanish pillar dollar was the "dollar of the fathers," as all of us whose recollection goes back into the first half of the century, will readily remember. And none of us will remember the *United States dollar* in circulation before the late civil war. In fact this dollar had never been a coin of circulation down to 1873.*

In 1873, when it was decided by long considered act of Congress to drop the silver dollar from our coinage laws, this dollar bore a premium of more than three per cent for shipment to the European mints. Meantime Germany had decided to change her money standard from silver to gold. France and the Latin union, finding that Germany would dismiss four or five hundred million dollars silver from her circulation, closed their mints to silver coinage; and Germany was compelled to resort to the London market to find vent for her useless silver. Then began the depreciation in its market value. Not until three or four years after the act dropping the further coinage of

* Secretary of Treasury Boutwell.

the silver dollar, and not until the effect of Germany's action began to be felt in the market value of silver, did our silver producers discover the "*enormous heinousness*" of what they termed "*our demonetization of the silver dollar.*" It is even discovered that several of them who have been most vociferous in denunciation of the measure, actually voted for it on its passage in Congress.

It is manifest from this relation that the silver coinage of our mints, down to 1878, at the adoption of the Bland-Allison coinage bill, never, from the organization of the government a century ago, exercised more than a very minor influence upon our monetary circulation, and our standard of value. The charge that the action of Congress in dropping the dollar from the coinage, was the cause of the depreciation of the value of silver, is wholly groundless. It is recognized in the light of the past, however, as a most fortunate circumstance that it was so dropped; as otherwise we should long since have been drifted upon the mono-metallic silver basis, along with Mexico, South America, China and India.

Since 1873, the world's annual product of silver, as shown by the statistics gathered by Dr. Leech, our present director of the mint, has doubled.* The cost of its reduction from the ores and baser metals with which it is usually found in combination, has been reduced fifty per cent, as has been hereinbefore referred to. We see in this fact how fully Hamilton's prophecy of a century ago, that changes in comparative value of gold and silver, would be changes in the state of silver rather than in gold, is verified. It is easy also to see that the disjointure of silver from the currencies of the European commercial nations, about 1871–76, effected only the beginning of that decline in commercial value which silver has since realized — a decline which our coinage annually, since 1878, of more than three times the number of standard silver dollars previously coined in the whole eighty-six years of the existence of our mint prior to that date, has been powerless to arrest, or even sensibly to influence. It becomes apparent also, that the restoration, on our part, of the *status quo* before 1873, as demanded by the advocates of free coinage, is not at all, in effect, restoring the then existing relation of things; but the adoption of free silver coinage on the old ratio would be *a fatal debasement of our standard of value.*

The advocates of the free coinage of silver claim that they are bimetalists with regard to our coinage; that they wish to have silver and

---

* Production of Gold and Silver, by Edw. O. Leech, Washington, 1890, page 61.

gold circulate together freely as money. Taking the experience and judgment of all sound financial minds as our guide, with all history of fiscal affairs for our enlightenment, there can be no escape from the conclusion that, in the present condition of affairs, the free coinage of silver with us would place us upon the *mono-metallic* basis of *silver*, and with the silver dollar, not as now, exchangeable for a gold dollar, but degraded to the commercial value of the quantity of silver in the dollar coin as our standard of value. It would be a degradation of our standard of value to the equivalent of seventy-five cents or less. Gold would stand at a premium of thirty-three and one-third per cent, and would, of course, disappear from circulation.

We do regard it important that silver be retained as part of the world's money as has been through all history the case. But, until the foremost commercial nations will jointly agree with us upon a ratio of coinage of the two metals, at which they will maintain both in circulation, under free coinage it would be fatal for us as a single nation to undertake it. And when undertaken, it would seem great folly not to recognize the commercial depreciation of silver, under the effect of its increased production, and widen very materially the former ratio of coinage value. Until such joint action of the nations can be reached, silver cannot with safety be more than it is at present — *a subsidiary currency.*

The attempts of our Congress to legalize the unlimited coinage of the silver dollar are prompted by the greed of the mining interest, joined with the advocates of *fiat money*. This interest is reinforced by many men of upright purpose who are misled by false statements and the specious arguments of its advocates. Nothing of sound public economy, of good finance, or of true statesmanship is found to support it. The single fact that, in the eighteen years since adopting the act dropping the further coinage of the silver dollar coin, *the world's annual production of silver has doubled*, is in itself alone sufficient reason for its refusal, unless at a very considerable widening of the present ratio of weight of the two metals, and in conjunction with the commercial nations. The relative values of silver and gold which four centuries ago had become established at about eleven to one, had a century ago reached fourteen and fifteen to one, and, during the present century up to 1873–76, were fifteen and one-half and sixteen to one, have for the past decade stood at twenty to twenty-two to one, with tendency still further to widen.

The production of silver in the United States was insignificant down to 1861, amounting usually to not more than $50,000 to

$150,000 annually. In 1861, the production was $2,000,000. Down to 1873, it had reached $27,750,000; in 1878 it had reached $51,200,000, and in 1889 it had reached *$64,646,000.

In 1878, when the Bland-Allison coinage act was adopted, the market prices for silver and gold bullion made their ratio of value by weight †17.94 to 1. In 1889 the ratio was 22.09 to 1. The mining interest meantime, more and more urgent for *free coinage*, succeeded during the last year in carrying the United States Senate for their measure. The menace of the silver standard was so imminent as to lead to the adoption of what is termed the Windom bill, in July last, which authorizes the purchase of 4,500,000 ounces silver bullion monthly, and storing it in the treasury. This provision for the purchase of the total production of the country (less the amount used in the arts), virtually authorizes the secretary as buyer, to cooperate with the miners as sellers, to use all legitimate means to crowd up the market price of silver. The act had the effect to raise the average market price for three or four months, from ninety-four to one hundred and fourteen cents, twenty cents per ounce, but fails, as experienced financial minds predicted it would do, to permanently advance the price.

What the ultimate effect of the continued operation of this act is to be on the future market value of silver, is a problem for the political economists, skilled in estimating the effects of syndicates and trusts to "*corner*" and "*bull*" the markets for products, to solve. Will the fact, known to the whole world, that there is here this accumulating hoard of useless silver, added to by yearly accretions of fifty-four million ounces,‡ have the effect to appreciate or to support the world's markets for silver? This query may well be weighed by our statesmen.

We have already coined under the Bland-Allison act of 1878, nearly or quite 400,000,000 dollar-coins of silver; although about 65,000,000§ is the largest number of them which, with all our effort, and the delivery of them free of charge at all points in the United States, we have been able to force into circulation. The remainder, about 335,000,000,‖ occupy the vaults and storage room of the government, at its expense to hold and guard them.

---

* *Mint Report*, 1890, page 183.

† This is the *average* ratio of value for the year, as computed by the director of the mint. See report for year ending June, 1890, page 184.

‡ Is it realized that this amount is over one thousand eight hundred and fifty tons of pure silver (of two thousand pounds each)? § *Mint Report for* 1890, page 15. ‖ Over nine thousand eight hundred tons (Neat).

The question seems to us a pertinent one — whether we have not gone about far enough in experiments with silver? Whether it is wise to jeopard further the interests of all the industries and the whole commerce and financial interests of the country, at the behest of the comparatively small interest of silver mining? And still further, whether we can afford to debase our *standard of value* to the level, and subject it to the future fluctuations of silver, with the certainty of its further depreciation?

There can be no escape from the conclusion, that under existing conditions the restoration to free coinage of the four hundred and twelve and one-half grain silver dollar would be a fatal depreciation of our standard of value. Let us now consider somewhat the effects of that depreciation.

It would mean that our *one thousand millions* of national debt, and the equal or greater sum of State and municipal debt, with the *five thousand millions* corporate debt — the untold millions of mortgage debt and of commercial debt, not payable by the terms of contract *in gold coin*, would suffer a depreciation of twenty-five per cent or more in actual value. It would mean a similar depreciation to the three or four million depositors upon their *fifteen hundred million* dollars deposits in the savings banks of the country; a like depreciation upon the *twenty-one hundred millions* deposited in the national banks and the *one thousand millions* deposited in State banks and trust companies of the country. And all this for whose benefit? For that of the few holders and producers of silver! And for what advantage even to them? To enable them to fancy they are getting rich, by calling seventy-five cents *a dollar*. It is the old story, slightly modified, of the advocates of fiat money.

It would mean the cutting down by one-fourth of the purchasing power of the daily, weekly or monthly income of the wage earner, of every person occupying official position, or otherwise employed on a salary, and of all persons of fixed incomes payable simply in dollars. It would mean a reduction of one-quarter to the widows and orphans upon all life insurance on the death of the husband and father. Its effects would reach every citizen of our broad land without exception in its blighting effect.

"Plague, pestilence and famine are, after all, but local and temporary calamities; floods, earthquakes, and cyclones are limited in their disastrous results; but a change in the standard of value affects all existing contracts, upsets all the calculations of business, reaches every family in the land and converts legitimate trade into speculation and

gambling." (Hon. A. S. Hewitt, letter to coinage committee, February 10, 1891.)

"The greatest financial evil that could befall the United States, would be to change to the silver standard." (From J. J. Knox, statement 21st February, 1891, page 18.)

It would disgrace us as a nation, as untrue to our honest obligations, as well as failing in sagacity to follow the course dictated by our true interest. We look with hope and expectation to the period when our country shall become the center of the world's exchanges, with all which that implies. That is clearly to be within our grasp in the near future, if wise statesmanship is to govern our affairs. Mr. Gladstone, in that remarkable article of his, entitled "Kin beyond the Sea," written twelve years ago, indicates in explicit terms this probability, and he also instances the disposition "to tamper with the true monetary creed" as one of the chief follies by which this desired consummation may be prevented.

It is quite clear that no other governmental folly could be more effective than this of free silver coinage, irrespective of the action of the other nations, to defeat our hopes of commercial supremacy, which might otherwise be open to us. No other single measure could be so prejudicial to all true progress of the country. Better, many times better, buy up the entire silver production of the country, and sink it in the middle of the sea, deeper than ever plummet sounded!

Most closely allied to the character of a people for integrity, for good faith, for all those virtues which give stability to and inspire confidence in national character, is the estimation in which they hold their standard of value. Considering the important part which credit plays in modern national and commercial affairs, *any* tampering with the standard of value of a people cannot be regarded as less than a *high public crime.* It is a crime against the national life and against the national honor, which should be held dearer than life. It is a blow at the national prosperity and welfare. A nation can do no one act so fatally blighting in its effect, and so all-pervading in its baleful influence, as in the degrading of its standard of value. The only persons benefited are the speculator and the crafty sharper. The honest debtor may imagine he is to lighten his load of debt by it, but in the end he finds even that gain more than compensated by the increased cost of all needed commodities. The imagined need of *more money,* and of *cheap money,* is mainly a delusion. It is *capital,* not cheap money, which the needy require, and *capital* is only to be earned by faithful labor. As Senator John Sherman says in a recent speech:

"No principle of political economy is better established than that the *producing classes* are the first to suffer and the last to gain by monetary changes." *

Let us hold unswervingly to the maintenance, *inviolate and unvariable*, of our *standard of value*, as we recognize the importance and the duty of doing with our standard weights and measures. A twenty-seven-inch yard stick, and a twenty-four-quart bushel, are as desirable, as reasonable and as honest as a nine-penny shilling, or a seventy-five-cent dollar.

---

*Speech 5th June, 1890, in United States Senate, page 26.

MAGNETIC OBSERVATIONS AT AND NEAR ALBANY, N. Y., BETWEEN THE YEARS 1686 AND 1892.

By VERPLANCK COLVIN.

[Read before the Albany Institute, January 4, 1888; Revised to December 1, 1892.]

Physical science affords no more interesting phenomenon than terrestrial magnetism. An invisible, yet potent omnipresent force, it is as important in its functions as is gravitation; and may, indeed, be a form or mode of energy supplementary to that greater power by which rivers run their courses downward to the sea. Terrestrial magnetism, however, differs from gravitation in being, even locally, an inconstant force; varying in accordance with its own local laws, and controlled by causes as yet little understood; yet penetrating and traversing even the massive mountains which gravitation holds so rigidly in place.

Every one appreciates the all-pervading nature of gravitation. Under its control the snow flakes fall steadily and regularly toward the earth. In obedience to gravitation the torrent of Niagara pours continuously into its gulf; and, at the command of this invisible force the Moon pursues the World; while the most distant planets, in their courses, majestically keep the orbits which the laws of gravitation prescribe.

When, after studying the wonderful symmetry and system of this great force, we encounter another mode of energy in matter, with an influence extending not only throughout the World but also — in all probability — throughout the Universe; associated with the phenomena of light, heat and electricity; we cannot but believe that this, the so-called terrestrial magnetism, is a condition of energy in matter that might be called, with better reason, *Cosmical Magnetism;* the natural magnetism of matter in space; and as much a portion of the celestial mechanism as gravitation itself.

It is true that the force controlling magnetism is, like electricity, invisible. When we speak of magnetism we refer to the reaction of this invisible force upon visible magnetic bodies; the substances we

call magnets, or those bodies susceptible to magnetism; and, by observing the varying movements of these bodies — suspended or otherwise so placed as to be free to the magnetic influence — we write down these movements, record the changes of pointing, trace the curves of motion, and find the intensity; until, by thus watching bodies controlled by the magnetic influence, we form some opinion of the invisible force that occasions these movements. Thus, with the aid of the various forms of magnetometer, we obtain mental concepts; ideals of the geometry of magnetic lines in space which, when systematized, may enable us, from a knowledge of the past events in terrestrial magnetism, to make predictions of future occurrences that will be of great benefit to mankind.

If for the theoretical "Ether" of school philosophies we substitute the idea of a *ubiquitous multi-mode energy;* ever existent in some ratio to matter, however infinitesimally attenuated this matter may be; we conceive an energy capable of an infinite variety of reactions, in accordance with the position or form of matter affected by it, and by this idea may arrive at a better conception of the nature of the phenomena of magnetism. Nor is this the only useful result of this modification of theory; for this conception of the energy of space, if it agree more closely and rationally with the facts of nature, may also, perhaps, account for all the so-called "physical forces," as resultants of the reactions of the diffused energy of space on the various local aspects of energy and matter.

It is not the purpose of the present paper, however, to consider or investigate the existence of a primal form of energy which shall replace in physical theory the "Ether" of the speculative philosophers. My views on this subject are already before the Institute.

The object of the present paper is to make public some new local magnetic data, with notices of other and more ancient records, which have hitherto escaped notice. It is thought best to accompany these observations with some calculations, which I have made by the formula considered by the chief mathematician of the United States Coast Survey the closest approximation so far made to the law of the magnetic declination at Albany, as a means of predicting the positions of the compass needle through its secular movement for many years to come. By comparing the computed predictions with the actual variation observed, not only is an idea had of the accuracy of this method of prediction — and, vice versa, of the irregularities in the actual movement of the needle as observed — but some notion also will be had of what is being sought by students of terrestrial magnetism, while the column of

differences, between the observations and predictions, will give an idea of the present degree of progress in this department of scientific research.

While avoiding, in this paper, any lengthy discussion of the nature of the energy of space; of force *per se;* as the cause of magnetic action; it is proper to call to mind some of the phenomena which, from their close connection with this subject, have made the expressions Terrestrial Magnetism and Cosmical Magnetism appear to be the proper titles for this branch of research.

The telescopic study of the Sun has shown that enormous disturbances of the solar atmosphere occur at times. Magnetic observations made upon the Earth, at moments identical with those of the solar disturbance, show that such solar action is synchronous with intense magnetic action at terrestrial stations. While we cannot prove that the solar disturbance is the cause of the magnetic disturbance upon the Earth, yet there appears to be a magnetic bond between the Sun and the Earth, through the apparently open intervening space, with a probability that the Sun is more nearly the centre of the origin, and the Earth the location of a resultant of the magnetic disturbance.

It is from this phenomenon that we obtain the mental concept of a primary or *Solar magnetism*, and a secondary or *Terrestrial magnetism.* It is a logical sequence of the instantaneous communication through space, of this mysterious influence, that there must be an energy and magnetism in space or *Cosmical Energy* or *Cosmical Magnetism;* an atmosphere of force, which probably controls both the magnetism of the Sun and its planets.

Hence by terrestrial magnetism is meant the magnetic atmosphere of the Earth; and "magnetic observations" are observations of the local action of this so-called atmosphere upon matter; the record giving an account of the visible movements of sensitively arranged magnets, or matter sensitive to magnetism, under the influence of this assumed magnetic atmosphere. The "magnets" of the magnetometers, or declinometers, are indices from whose movements we are able to form some opinion of the invisible, magnet-making Energy, the powers of which we seek to understand from its functions, by gauging, measuring or weighing its action on matter sensitive to its influence.

In every case the observations at any particular locality afford only what may be called a knowledge of the local magnetism; or, more properly — for we have no brief name for it — the condition of the cosmic magnetic energy, under the local influences.

It is to such observations of the local magnetic conditions at Albany, N. Y., at a great number of dates during the past two hundred years, that I desire to call your attention; and I particularly invite your attention to the record given of observations prior to the year 1817. Though these observations are few in number; only nine having been preserved between the years 1686 and 1807; yet they contain the most important date of *the epoch of the maximum easterly movement of the magnetic needle at Albany*, the observation nearest to this period having been made by the Surveyor-General of this State, Simeon De Witt, in the year 1805. The degree of maximum easterly movement, which is also the minimum westerly declination of the needle, was found by General De Witt to be +4° 58′ west of north from the true meridian at Albany on the 30th day of July, 1805.

This result is so different from the value of the declination assigned to this date by theory, that I have been at great pains to see whether other and corroborating data could not be found. In this I have been successful; and, from records left by the late Prof. Joseph Henry, have found the declination in 1798 to have been +5° 00′ West of true North· which fully corroborates the view of General De Witt that the easterly movement of the magnetic needle at Albany continued until about the year 1805 (or 1807) and then suddenly changed to an annual westerly movement. That previously to this date, the magnetic needle at Albany had a continuously easterly movement, I have been able to satisfy myself from other data, of early surveys of the land patents in the vicinity of Albany. This unpublished data shows that in the year 1686 the magnetic declination at Albany was D = + 9° 09′ (North-west); in 1735, D = + 7° 40′ (North-west); in 1768 D = + 6° 39′ (North-west); in 1787, D = + 5° 03′ (North-west); in 1789, D = + 5° 27′ (North-west); in 1798, D = + 5° 00′ (North-west); in 1805, D = + 4° 58′ (North-west); indicating a decrease of declination as the year 1805 is approached; or a continuous easterly movement of the magnetic needle, as claimed by Surveyor-General De Witt, in his record of April 27th, 1825.

The fact that these more ancient observations differ entirely from what the present theory of local magnetism would indicate, makes them of the greatest importance as the key to a more accurate theory of the period and extent of the alternative progression and retrogression or secular movement of the magnetic force at Albany.

To this collection of ancient observations, I have added all those which are comparatively well known, so as to bring together all the data, of value for this investigation, in one paper.

The new data, being the observations at Albany of the magnetic declination between the years 1874 and 1892, are my own observations and are now for the first time made public.

My station of observation has been in the grounds of my residence on Western avenue in this city, and is marked by monuments and reference points which may hereafter be found and identified by means of the accompanying diagram. The magnetic station is marked by a brown-stone monument having a copper-plug, with cross, set as centre.

In the diagram the central circle is the brown-stone monument of the magnetic station; the other circles near this central station are the limestone piers of the astronomical instruments.

The geodetic coördinates of the brownstone monument are

LATITUDE = 42° 39′ 43″.63.
LONGITUDE, in arc = 73° 46′ 33″.48.
" in time = 4h. 55m. 06.23s. W. from Greenwich.
ALTITUDE = 227 $\frac{905}{1000}$th feet above mean tide level.

While there are several phases of the magnetic phenomena, usually investigated at permanent stations; as the intensity with which it affects magnetic matter, the dip angle and perturbations of these phases of its force, yet the "variation" or, more properly, the Declination of the magnetic needle has been chiefly studied by navigators and surveyors, as of immediate practical importance, and hence their records afford the most ancient data, and the best basis for magnetic investigations. When the intensity and dip have been fully correlated mathematically to the declination, we may be able to hope for a full knowledge of the general magnetic influence by means of observations of the declination alone.

The declination of the magnetic needle is to us, therefore, the most important reaction of the magnetic force upon matter; and it is for this reason, that I have specially studied, and made it the subject of the present paper.

I here, therefore, present in tabular form:

(1.) A collection of observations of the magnetic declination at Albany, N. Y.

(2.) A table showing prediction computations, which I have made by the mathematical formula hitherto regarded as the expression most conveniently representing the declination, according to the idea entertained by mathematicians, of the local magnetic law at Albany.

The formula, by which the results in table second were computed, was devised by Prof. Charles A. Schott, chief of the computing division of the U. S. Coast and Geodetic Survey at Washington. This formula he calls empirical. It was prepared many years since on the basis of the few observations then available for this locality.

The newly collected and observed data presented in this paper extends more than one hundred years back of the data which Prof. Schott used as the basis of his formula: and, doubtless, on this new data a more exact formula may be constructed.

I had hoped at this time to present a new formula of my own computation for this local magnetic law on the basis of the new data; but, as the time at my disposal has not been sufficient to permit me to assign weights (or estimates of precision) to each of the observations communicated, I must defer the pleasure of presenting this new formula until another time; and will merely transmit my observations and collated data, accompanied by computations by the old formula; which, while affording a scale of numerical comparison with the observations, will serve some present purposes, and give an idea of the supposed extent of the secular change in declination and of the processes, so far, devised for the prediction of the phenomena.

Using the old data only, the empirical formula of Schott for the magnetic declination at Albany is —

$$D = + 8^{\circ}\cdot 17 + 3^{\circ}\cdot 02 \text{ Sin } (1\cdot 44\ m - 8^{\circ}\cdot 3)$$

in which D = the declination at any desired time in calendar years from the epoch 1850.

From this formula it will be seen that the terrestrial magnetic force is not as simple a form of energy as gravitation; especially in view of the fact that this is only one expression, suited to only one locality, and not applicable to any even moderately distant place.

This shows how important is the annual collection of local magnetic data, at a great number of points, if we are ever to attain a better understanding of the nature and origin of the magnetic force.

The computations in table (2) by the old formula I have extended beyond the limits for which they were probably intended in order to show the maximum and minimun points and numerical nature of the curve of declination according to Schott's formula, as well as to compare its values with the actual observations newly communicated in the first table. In this table the last column shows the ± differences of the results by formula from the actual observations.

With this explanation, this collection of data is herewith transmitted to the Institute, with the hope and intention that in a future paper these results will be discussed and some advancement made in the local theory and formula for the prediction of magnetic phenomena at Albany.

TABLE I.

Records of Observations of the Declination of the Magnetic Needle, at Albany, N. Y., between the years 1686 *and* 1892; *collected and observed by Verplanck Colvin.*

NOTE.—In 1609, September 13th, D = + 13° 00′ was observed by Robert Juet, sailing-master of Hendrick Hudson's ship, the Half Moon, on tide-water of Upper Hudson. The year 1680 was remarkable for five comets. In 1806 a remarkable total eclipse of the sun occurred, which General DeWitt thinks may have affected the earth's magnetism.

YEAR.	Date.	Declination.	Remarks.
1686.....	Month not given.....	+ 9° 09′ North-west..	Early record, Van Rensselaer patent.
1735.....	Month not given.....	+ 7 40 " ..	From notes of J. R. Bleeker, surveyor, etc.
1768.....	Month not given.....	+ 6 39 " ..	From notes of J. R. Bleeker, surveyor, etc.
1787*.....	Month not given.....	+ 5 03* " ..	Records of Livingston manor.
1789.....	Month not given.....	+ 5 27 " ..	New York Documentary History.
1798.....	Probably April	+ 5 00 " ..	Prof. Joseph Henry.
1805.....	July 30th	+ 4 58 " ..	Simeon De Witt.
1807.....	September 4th.....	+ 5 43 " ..	Simeon De Witt.
1817.....	October 4th	+ 5 44 " ..	Surveyor-General of State of New York.
1818.....	August 1st	+ 5 45 " ..	Surveyer-General of State of New York.
1825.....	April 24th	+ 6 00 " ..	Surveyor-General of State of New York.
1828.....	September	+ 6 14 " ..	State geological survey.
1828.....	September	+ 6 16 " ..	State geological survey.
1828.....	September	+ 6 18 " ..	State geological survey.
1830.....	June	+ 6 18 " ..	State geological survey.
1831.....	May	+ 6 25 " ..	State geological survey.
1831.....	May	+ 6 32 " ..	Geological survey.
1831.....	November.....	+ 6 40 " ..	Regents' report and Silliman's Journal.

* Corrected to Albany Station D = + 5° 34′

1833	November	+ 6	40	"	..	Regents' report and Silliman's Journal
1834	October	+ 6	40	"	..	Silliman's Journal, 1838, vol. xxxiv.
1836	October	+ 6	47	"	..	Silliman's Journal, 1838, vol. xxxiv.
1847	November	+ 7	35	"	..	Regents' report.
1855	August 31st	+ 7	54.7	"	..	Prof. C. A. Schott.
1856	September 1st	+ 8	39.2	"	..	Karl Freisach, of Vienna.
1858	May 12th and 14th	+ 8	17	"	..	G. W. Dean, U. S. C. Survey.
1874	July 25th	+ 9	08.6	"	..	
1879	October 21st and 24th	+ 9	51.7	"	..	
1880	April 10th	+ 10	13.7	"	..	Verplanck Colvin, at station in grounds of his residence, between Western avenue and State street, Albany, N. Y.
1881	April 30th	+ 10	20	"	..	
1882	April	+ 10	12*	"	..	
1883	June	+ 10	17*	"	..	
1884	June 3d	+ 10	24	"	..	Latitude = 42° 39′ 43″
1885	May 22d	+ 10	12.7	"	..	
1886	June 5th	+ 10	16.1	"	..	Longitude = 73° 46′ 33″
1887	June 28th	+ 10	21.3	"	..	
1888	April 25th	+ 10	24.5	"	..	" in time $4^h\ 55^m\ 06^s$
1889	May	+ 10	23*	"	..	
1890	July 19th	+ 10	21.7	"	..	Altitude above sea level $227\frac{995}{1000}$ feet.
1891	February 3d	+ 10	29.9	"	..	
1892	November 22d	+ 10	37.0	"	..	

* Preserved on slips only; records mislaid.

TABLE II.

Probable Mean Magnetic Declination at Albany, according to Prof. Schotts formula.

[EMPIRICAL.]

YEAR.	Computed Declination.	Annual change.	Observed Declination.	Differences.
January 1st.				
1800	+ 5° 11′.5			
1801	5 12 .6			
1802	5 13 .6	+ 1′.04		
1803	5 14 .7			
1804	5 15 .7			
1805	5 16 .8		+ 4° 58′	+ 18′.8
1806	5 18 .4			
1807	5 20 .0	+ 1′.59	+ 5° 43′	— 23′.0
1808	5 21 .6			
1809	5 23 .2			
1810	5 24 .7			
1811	5 26 .9			
1812	5 29 .0	+ 2′.11		
1813	5 31 .1			
1814	5 33 .2			
1815	5 35 .3			
1816	5 37 .9			
1817	5 40 .5	+ 2′.60	+ 5° 44′	— 03′.5
1818	5 43 .1		5 45	— 01′.9
1819	5 45 .7			
1820	5 48 .3			
1821	5 51 .4			

1822	+ 5° 54′.4	+ 3′.05		
1823	5 57 .5			
1824	6 00 .5			
1825	6 03 .6		+ 6° 00′	+ 3′.6
1826	6 07 .0			
1827	6 10 .7	+ 3′.64		
1828	6 14 .3		+ 6° 14′	+ 0′.3
1829	6 18 .0			
1830	6 20 .9		+ 6° 18′	+ 2′.9
1831	6 24 .4		6 32.3	— 1 .9
1832	6 28 .0	+ 3′.59		
1833	6 31 .6		+ 6° 40′	— 8′.4
1834	6 35 .2		6 40 .	— 4 .8
1835	6 39 .8			
1836	6 43 .9		+ 6° 47′	— 3′.1
1837	6 48 .0	+ 4′.08		
1838	6 52 .1			
1839	6 56 .1			
1840	7 00 .2			
1841	7 04 .5			
1842	7 08 .8	+ 4′.30		
1843	7 13 .1			
1844	7 17 .4			
1845	7 21 .7			
1846	7 26 .2			
1847	7 30 .6	+ 4′.45	+ 7° 35′	—4′.4
1848	7 35 .1			
1849	7 39 .5			
1850	7 44 .0			
1851	7 48 .5			
1852	7 53 .1	+ 4′.53		

TABLE II—(*Continued*).

YEAR.	Computed Declination.	Annual change.	Observed Declination.	Differences.
January 1st.				
1853	+ 7° 57′.6			
1854	8 02 .1			
1855	8 06 .7		+ 7° 54′.7	+ 12′.0
1856	8 11 .2		8 39 .2	— 28 .0
1857	8 15 .8	+ 4′.54		
1858	8 20 .3		+ 8° 17′.0	+ 3′.3
1859	8 24 .9			
1860	8 29 .4			
1861	8 33 .9			
1862	8 38 .4	+ 4′.48		
1863	8 42 .9			
1864	8 47 .3			
1865	8 51 .8			
1866	8 56 .2			
1867	9 00 .5	+ 4′.35		
1868	9 04 .9			
1869	9 09 .2			
1870	9 13 .6			
1871	9 17 .7			
1872	9 21 .9	+ 4′.15		
1873	9 26 .1			
1874	9 30 .2		+ 9° 08′.6	+ 21′.6
1875	9 34 .4			
1876	9 38 .3			
1877	9 42 .2	+ 3′.88		

1878	+ 9 46′.0			
1879	9 49 .9		+ 9° 51′.7	— 1′.8
1880	9 53 .8		10 13 .7	+ 19 .9
1881	9 57 .4		10 20	— 22 .6
1882	10 00 .9	+ 3′.56	10 12	— 11 .1
1883	10 04 .5		10 17	— 12 .5
1884	10 08 .1		10 34 .5	— 26 .4
1885	10 11 .6		10 09 .1	+ 2 .5
1886	10 14 .8		10 16 .1	— 1 .3
1887	10 18 .0	+ 3′.17	10 21 .3	— 3 .3
1888	10 21 .2		10 24 .5	— 3 .3
1889	10 24 .3		10 23 .0	+ 1 .3
1890	10 27 .5		10 21 .7	+ 5 .8
1891	10 30 .3		10 29 .9	+ 0 .4
1892	10 33 .0	+ 2′.74	10 37 .0	— 4 .0
1893	10 35 .8			
1894	10 38 .5			
1895	10 41 .2			
1896	10 43 .5			
1897	10 45 .8	+ 2′.26		
1898	10 48 .1			
1899	10 50 .3			
1900	10 52 .6			
1901	10 54 .3			
1902	10 56 .1	+ 1′.75		
1903	10 57 .9			
1904	10 59 .6			
1905	11 01 .4			
1906	11 02 .6			
1907	11 03 .8	+ 1′.21		
1908	11 05 .0			

TABLE II — (*Continued*).

YEAR.	Computed Declination.	Annual change.	Observed Declination.	Differences.
1909	+ 11° 06′.2			
1910	11 07 .5			
1911	11 08 .1			
1912	11 08 .8	+ 0′.65		
1913	11 09 .4			
1914	11 10 .1			
1915	11 10 .7			
1916	11 11 .3			
1917	11 11 .9	+ 0′.60		
1918	11 12 .5			
1918.26 Maximum point W.	+11 13 .2			
1920	11 11 .2			
1925	11 09 .1			
1930	11 06 .7			
1935	10 55 .6			
1940	10 40 .0			
1950	10 16 .7			
1960	9 40 .5			
1970	8 58 .6			
1975	8 36 .3			
2,000	6 45 .9			
2,043	5 00 .0			
2,105.76 Minimum point by formula	0 00 .0			

INDEX.

PAGE.

Albany Institute — A retrospect. By President Kip, 1889..... 103
Bixby, G. F., Site of the first battle of Lake Champlain..... 122
Burlingame, E. The Liquor question..... 137
Christian Science, and allied methods of treatment. By S. A. Russell... 167
Coast defense of United States. By V. Colvin..... 69
Colvin, V., on defenses of United States coast..... 69
" Magnetic observations near Albany, N. Y., 1686–1892..... 283
Edible wild fruits of New York. By C. H. Peck..... 83
Finley, J. P., Ascent of Pike's Peak in winter season..... 189
First battle of Lake Champlain, site of. By G. F. Bixby..... 122
Geographical progress, 1500–1600. By G. R. Howell..... 241
Homes, Henry A., Memorial. By G. W. Kirchwey..... 1
Howell, G. R., Progress of geographical knowledge, 1500–1600..... 241
Insects of the past year and progress in insect studies. By J. A. Lintner. 227
Kip, Leonard, Our retrospect..... 103
Kirchwey, G. W., Memorial on Henry A. Homes..... 1
Lintner, J. A., Insects of the past year..... 227
Liquor question. By E. Burlingame..... 137
Magnetic observations near Albany, N. Y., between the years 1686 and 1892. By V. Colvin..... 283
Map-making, progress in, 1500–1600. By G. R. Howell..... 241
Mather, F. G., on profit-sharing..... 27
Miller, E. J., on the West India Company and the Walloons..... 53
New York State, its first Constitution. By S. N. D. North..... 39
North, S. N. D., the first Constitution of New York..... 39
Paper currency. By S. W. Rowell..... 205
Peck, C., Edible wild fruits of New York..... 83
" on weeds..... 251
Pike's Peak in the winter season. By J. P. Finley..... 189
Profit-sharing. By F. G. Mather..... 27
Retrospect, our. By Leonard Kip..... 103
Rowell, S. W., on paper currency..... 205
Russell, S. A., on Christian Science, etc..... 167
Schlesinger, M., on the Talmud..... 15
Silver coinage and cheap money. By C. P. Williams..... 267
Standard of value. By C. P. Williams..... 267
Talmud, the. By M. Schlesinger..... 15
Walloon settlements in New York. By E. J. Miller..... 53
Weeds. By C. H. Peck..... 251
West India Company and the Walloons. By E. J. Miller..... 53
Williams, C. P., on the standard of value; free silver coinage, etc..... 267